Memorandum of Agreement
Between
The Central Intelligence Agency
and
The Virginia Department of Highways and Transportation

THIS AGREEMENT, Made this 5th day of Sept., 1984, by and between the United States of America, acting by and through the Central Intelligence Agency, and the Commonwealth of Virginia, acting by and through the State Highway and Transportation Commissioner;

WITNESSETH: THAT WHEREAS, the United States Government is the owner of land located in Fairfax County, Virginia, adjacent to State Route 123 on which it proposes to construct certain new and additional facilities which will modify existing traffic volume and distribution and;

WHEREAS, it is mutually desirable between the parties hereto that improvements be constructed so as to enhance an orderly and safe flow of traffic for the users of State Route 123 and;

WHEREAS, it is mutually desirable that the Central Intelligence Agency implement traffic management strategies that limit the number of lanes on Route 123 required to be constructed to four through lanes and;

WHEREAS, the Commonwealth of Virginia desires recourse in the event the Central Intelligence Agency fails to properly implement and maintain sufficient traffic management strategies;

NOW, THEREFORE, for and in consideration of mutual covenants herein stipulated to be kept and performed, it is agreed by the parties hereto as follows:

Article I

1. The CIA will:

a. Establish a pattern of work shifts for employees of the CIA Headquarters sufficient to ensure that the peak hourly rate (PHR) of arrival and departure of vehicles at the Headquarters does not exceed the existing peak hourly rate of arrival and departure at each existing entrance. These rates are as follows:

Location	Arrival (PHR)	Departure (PHR)
Route 123	1070	1130
Route 193	725	725
Geo Washington Parkway	1055	800

It is understood that changes in roadway traffic volumes may occur, however, if these changes alter the basic intent of the foregoing, then the CIA will be required to install the additional lanes noted in 1.c.

b. Perform monitoring of peak vehicle arrival and departure hourly rates at each existing CIA entrance on a quarterly basis and report the findings to the District Engineer, Northern Virginia District, Virginia Department of Highways and Transportation.

c. Provide funding to the Commonwealth not to exceed $500,000.00 to implement such additional road improvements as may be mutually agreed to, but in no event less than six through lanes on Route 123 from the vicinity of Potomac School Road to the vicinity of Merchants Lane, as necessary to enhance an orderly and safe flow of traffic in the event CIA fails to operate within the agreed upon peak hourly rates of arrival or departure for two consecutive quarters. It is understood and agreed that the CIA will hold appropriated funds in reserve for this purpose until 30 September 1990. It is understood and agreed that thereafter it will be necessary for the CIA to submit a federal budget request for authorization and appropriation of required funding.

d. Permit the State to make appropriate traffic count checks at the three existing entrances when deemed necessary by the State.

Article II

2. The State will:

a. Provide design and construction services as specified and agreed to in the Memorandum of Agreement dated 10 June 1983.

b. Provide prompt written warning to the CIA at the first instance in which monitoring demonstrates vehicle rates in excess of those specified by this Agreement.

c. Release the CIA from further financial liability at such time as the State installs the additional lanes planned in the current Statewide Transportation Plan for the Year 2005.

d. Hold the CIA blameless for breaches of this Agreement caused by a State of National Emergency declared by the President.

Approved:

Commonwealth of Virginia
Department of Highways and
Transportation

Assistant Attorney General

Harold C. King - Commissioner

United States of America
Central Intelligence Agency

STAT

Deputy Director for Administration

Roadway Improvements Relating to Expansion Of The CIA Headquarters

Draft Preliminary Design Report

April 20,1984

prepared by
Dewberry & Davis
and
JHK & Associates

for the
Virginia Department of Highways and Transportation

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

ADDENDUM

to

THE PRELIMINARY DESIGN REPORT

for

ROADWAY IMPROVEMENTS

RELATING TO THE

CIA HEADQUARTERS EXPANSION

prepared by

DEWBERRY & DAVIS

and

JHK & ASSOCIATES

for

THE VIRGINIA DEPARTMENT OF HIGHWAYS AND TRANSPORTATION

September 21, 1984

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

INTRODUCTION

The Preliminary Design Report which follows presents the results of an evaluation of roadway improvements necessary to provide satisfactory access to and minimize impacts of the CIA Headquarters Expansion. This Report was submitted to The Virginia Department of Highways and Transportation and the CIA on April 20, 1984. It identified two Alternatives which could satisfactorily accommodate projected traffic for a 2005 design year horizon. Also addressed in the Report was a timetable for constructing these roadway improvements in order to minimize impacts from the traffic attributable to the CIA Headquarters Expansion.

The two candidate alternatives evolved from a systematic, step-by-step, study process. This process included:

- **Inventory**
- **Traffic Impact Analysis**
- **Identification and Evaluation of Preliminary Alternatives**
- **Selection of Candidate Alternatives**
- **Preliminary Design and Evaluation of Candidate Alternatives**
- **Preliminary Design Report**

Study findings were evaluated periodically with the CIA's Traffic Advisory Committee to obtain official and citizen input and provide the Design Team the necessary guidance. The findings presented in the Preliminary Design Report were reviewed with this Committee on June 14, 1984.

Implicit in the traffic impact analysis, formulation and evaluation of alternatives, and in the preliminary design of the two candidates, was the forecasted increase in peak hour traffic directly attributable to the expansion of the CIA Headquarters. Furthermore, this anticipated growth in traffic was expected to require that Route 123 be widened from 2 lanes in each direction to 3 lanes in each direction upon completion of the expansion of the CIA Headquarters or soon thereafter. Opposition to the widening of Route 123 is the principal concern within the Community.

AGREEMENT BETWEEN THE VIRGINIA DEPARTMENT OF HIGHWAYS AND TRANSPORTATION AND THE CIA

The issue of whether the CIA would be able to implement traffic management strategies that would effectively limit increases in traffic at the Headquarters Complex preceded this Study and continued to be a topic of discussion as the work proceeded. Subsequent to the completion of the Preliminary Design Report, the CIA determined that it was in its best interests to enter into an Agreement with The Virginia Department of Highways and Transportation wherein the Agency would be contractually obligated to maintain peak hour traffic volumes at current levels.

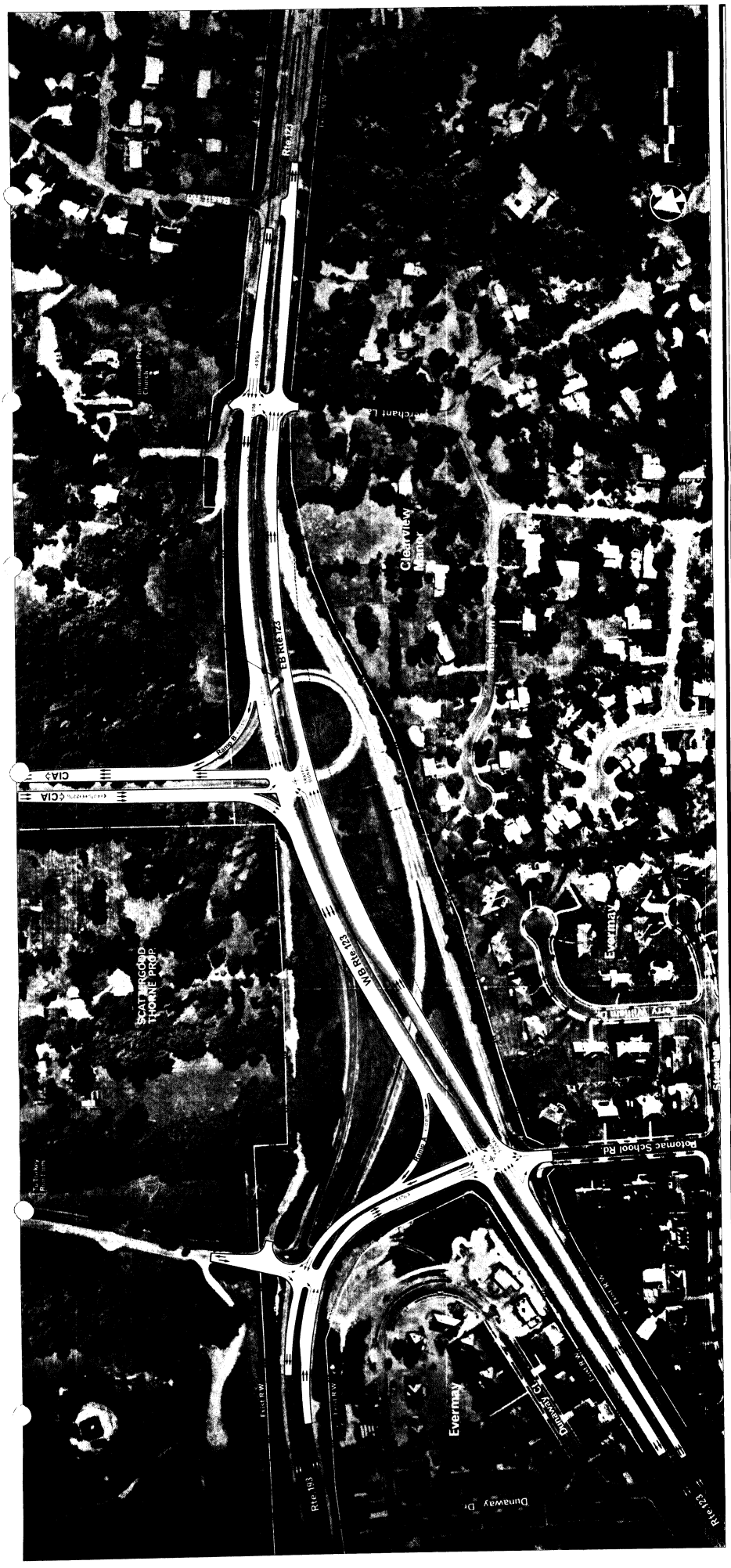
A copy of this Memorandum of Agreement, dated September 5, 1984, is included in this Report for reference as a part of this Addendum.

MODIFICATIONS TO CANDIDATE ALTERNATIVES

It is the intention of The Virginia Department of Highways and Transportation and the CIA to implement one of the Candidate Alternatives developed during the preliminary design process. However, the alternatives would be modified as required to provide 2 lanes in each direction when initially constructed. The third thru lane in each direction could then be added should the CIA's traffic management strategies prove ineffective or, alternatively, when the remainder of Route 123 is widened by the Department through the Study Area to accommodate long term growth in traffic in accordance with State and Local transportation plans.

Under the terms of the Agreement between the CIA and The Virginia Department of Highways and Transportation, any significant increase in traffic volumes at the CIA access points would be cause for undertaking the widening of Route 123 to provide 3 thru lanes in each direction within the Study Area. Funds would be placed in an escrow account by the CIA to ensure that they would be available for this purpose.

Aerial mosaics showing Alternatives 2 and 4 as they would be modified to initially defer the third lane in each direction are immediately following. As indicated, 2 thru lanes would be provided with appropriate turning lanes where necessary.



ALTERNATIVE 2
Route 123/ Route 193 CIA Entrance

Figure 14
As Amended

ALTERNATIVE 4
Route 123 Route 193 CIA Entrance

Figure 15
As Amended

IMPROVEMENT ALTERNATIVES FOR THE CAPITAL BELTWAY/GWMP INTERCHANGE

Improvement Alternatives

Three alternatives were developed and evaluated for this location. They are shown on Figures 3 through 5 and described below:

Alternative 1 - Four Lane Beltway with Standard Acceleration Lane for the GWMP on-ramps (Figure 3)

With this scheme, four through lanes in each direction would be provided through the GWMP interchange and across the Cabin John Bridge. Standard acceleration and deceleration lanes for all entering and exiting ramps of the Capital Beltway/GWMP Interchange would be provided except for the ramp from the GWMP to the southbound Beltway. This acceleration lane would be of substandard length to avoid decreasing horizontal clearances at the Service Road bridge over the Beltway.

Alternative 2 - Four Lane Beltway with Auxiliary Lane Between Interchanges (Figure 4)

With this Alternative, the Beltway would be widened so that four through lanes plus an auxiliary lane in each direction would be provided from the GWMP Interchange across the Cabin John Bridge. A fifth lane on the outer loop of the Beltway between the GWMP and Route 193 interchange would also be provided. The currently programmed widening of the Cabin John Bridge would be utilized to provide the added lane on the structure. No shoulders for disabled vehicles would be provided on the Bridge and the horizontal clearances beneath the Service Road bridge would be very substandard.

Alternative 3 - Four Lane Beltway with Weaving Between GWMP and Route 193 Eliminated (Figure 5)

This concept would involve four through lanes plus a maneuvering lane in each direction across the Cabin John Bridge. Extensive modifications to the outer loop of

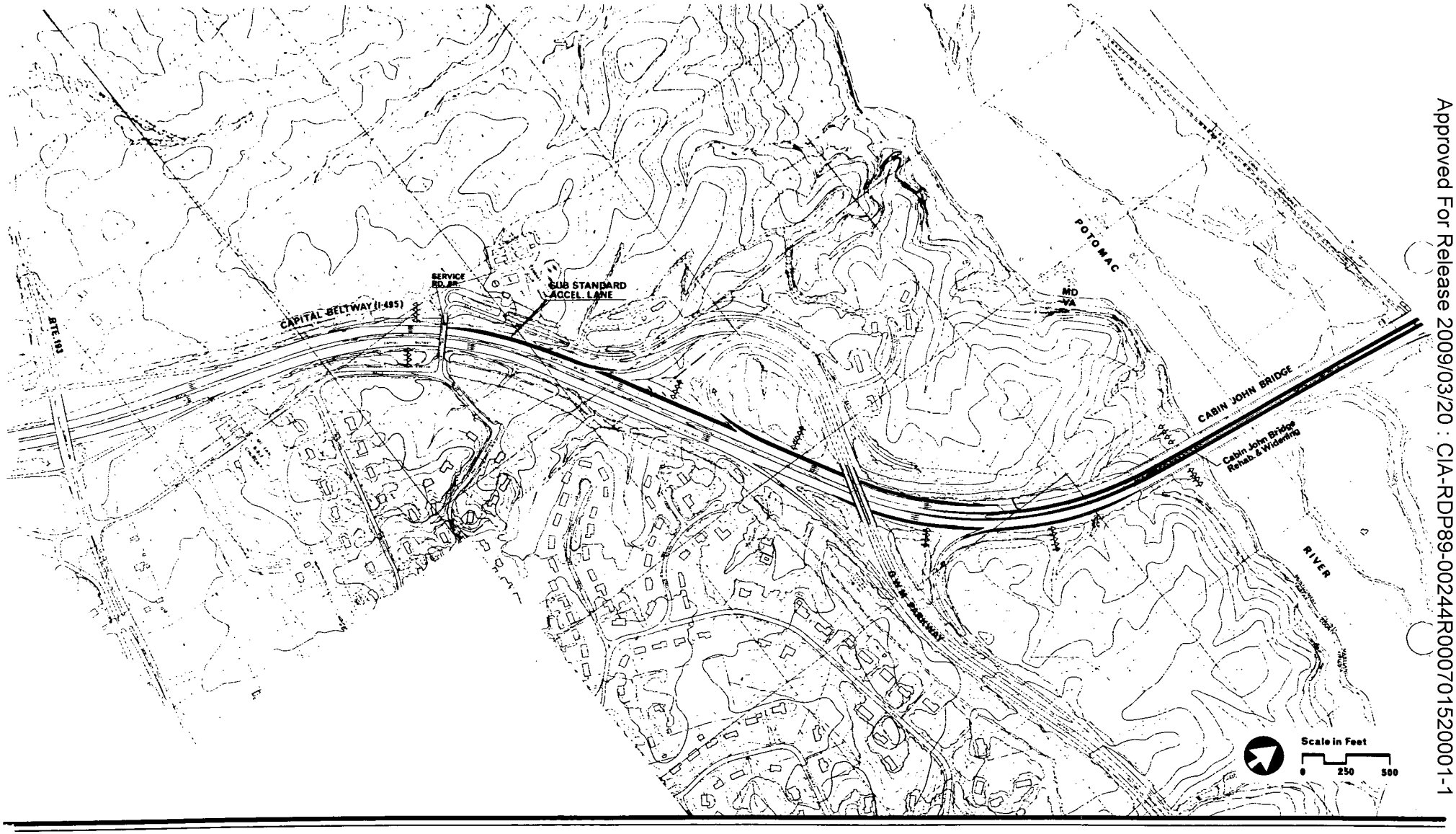


Figure 3

LEGEND
- Proposed Roadway
- Exist. Roadway to be Maintained
- X X X Abandoned Roadway

ALTERNATIVE 1
Capital Beltway (I-495) Interchange With GWM Parkway

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

PRELIMINARY DESIGN REPORT

for

ROADWAY IMPROVEMENTS

RELATING TO THE

CIA HEADQUARTERS EXPANSION

prepared by

DEWBERRY & DAVIS

and

JHK & ASSOCIATES

for

THE VIRGINIA DEPARTMENT OF HIGHWAYS AND TRANSPORTATION

April 20, 1984

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

I. INTRODUCTION AND BACKGROUND

Presented in this Preliminary Design Report are the results of an evaluation undertaken to identify roadway improvements which would be most effective in accommodating increased traffic volumes attributable to the current expansion program at the Central Intelligence Agency (CIA) Headquarters in Langley, Virginia. The study scope was defined in the Memorandum of Agreement between the Virginia Department of Highways and Transportation (VDHT) and Dewberry & Davis (D&D) and JHK & Associates dated October 19, 1983. Phase I of that agreement outlines the initial phase of project development.

The current expansion of the CIA Headquarters, scheduled for completion in 1986, will result in significant increases in traffic volumes on approach roadways. Peak hour traffic volumes will increase by approximately 1,000 vehicles. A series of alternative roadway improvements that would provide additional capacity to serve increases in regional (background) traffic and traffic resulting from the CIA expansion are evaluated as to cost, effectiveness and other features. Figure 1 shows the study area. Three roadway elements have been investigated for possible improvement. These are:

- George Washington Memorial Parkway (GWMP) between Route 123 and I-495, including interchanges at these locations.
- George Washington Memorial Parkway Interchange at CIA Entrance Roadway.
- Route 123 (Dolley Madison Boulevard) at CIA Entrance and the adjacent intersection between Route 123 and Route 193 (Old Georgetown Pike). Also included is the Turkey Run Access Road intersection with Route 193.

Phase I comprised the following tasks:

- Inventory, site reconnaissance and data collection.
- Traffic Impact Analysis (described in Technical Memorandum No. 1).
- Identification and Evaluation of Preliminary Alternatives (described in Technical Memorandum No. 2).
- Review and Selection of Candidate Alternatives.

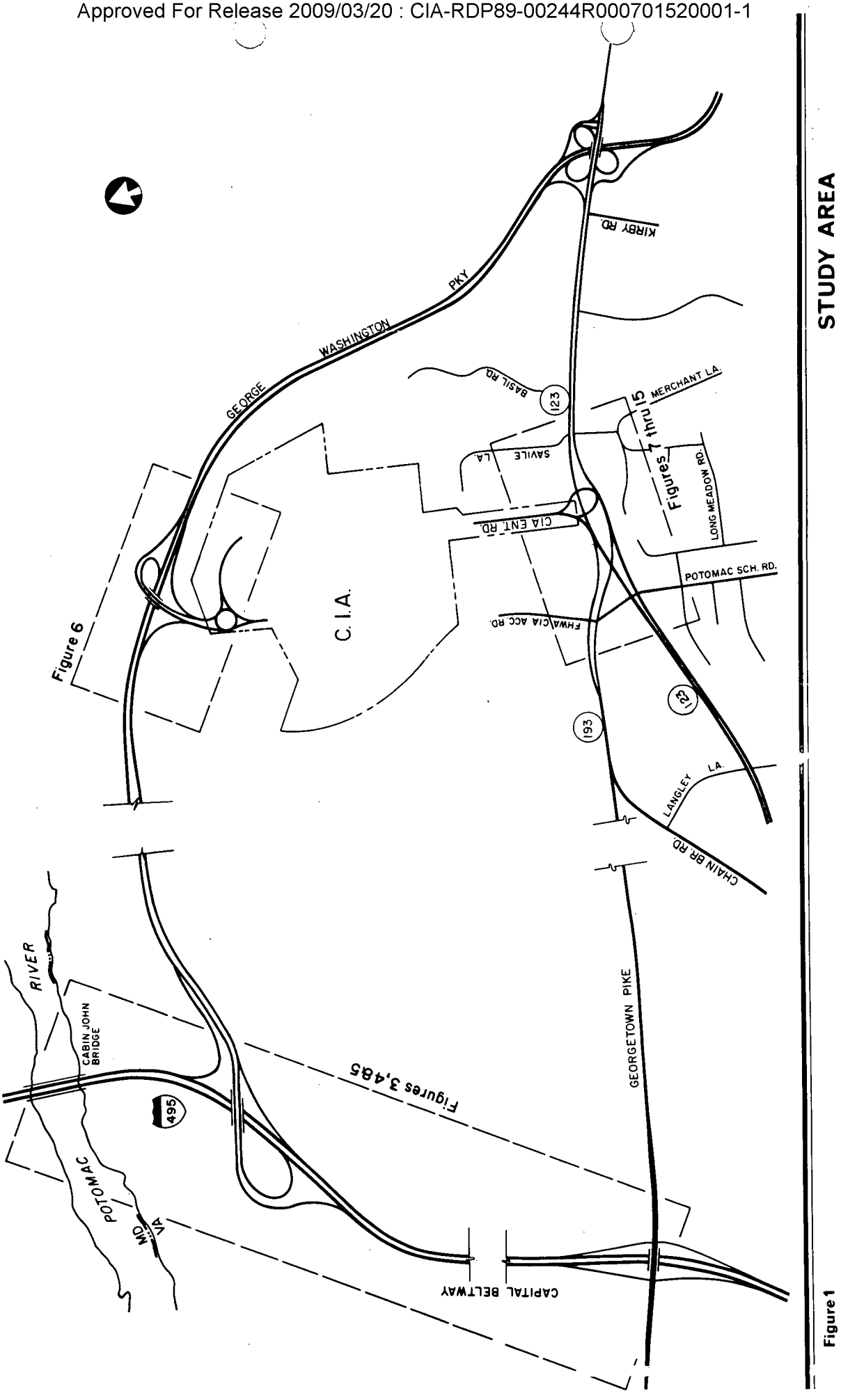


Figure 1

- Preliminary Design and Evaluation of Candidate Alternatives.
- Review of Preliminary Design and Evaluation.
- Preparation of Preliminary Design Report.

Subsequent to this Preliminary Design Report, VDHT will prepare an Environmental Assessment of the possible consequences associated with the candidate alternatives. This Preliminary Design Report and the results of the environmental assessment will form the basis for a public meeting to be conducted by the CIA.

A public participation program has been an integral element of the study process. This program has afforded a formal opportunity for citizen groups and representatives of several public agencies to monitor progress and provide input into the decision-making process. The CIA Traffic Advisory Committee has representation from the following:

1. McLean Citizens Association
2. Ad Hoc Committee for Traffic To/From CIA (represents the Clearview Manor, Country Day School, Downscrest, Evermay, Langley Oaks, Lynwood Communities).
3. The Virginia Department of Highways and Transportation (VDHT)
4. National Park Service, George Washington Memorial Parkway
5. National Capital Planning Commission
6. Fairfax County
7. Central Intelligence Agency
8. Representation from offices of elected local and federal officials.

Prior reports have been developed covering the traffic analyses and describing a series of alternative roadway improvements that would serve the projected traffic demand. Technical Memorandum No. 1 1/ contained an analysis of the impacts that increased traffic generated by the CIA expansion would have on vehicular traffic volumes on each of the major CIA access points and other vicinity intersections.

1/ ANALYSIS OF PROJECTED LEVELS OF TRAFFIC SERVICE BASED ON THE EXPANSION OF THE CIA HEADQUARTERS, Dewberry & Davis and JHK & Associates, November, 1983.

Traffic impacts were examined for the year 1986 (the assumed completion year for the CIA expansion) as well as for the year 2005, the twenty-year design horizon for which long range highway plans are prepared. The analyses provided in Technical Memorandum No. 1 pointed out specific problem areas that would be encountered in 1986 and in the horizon year. A more detailed discussion of the contents of Technical Memorandum No. 1 is in Chapter 2 of this report.

Based on the findings of the traffic impact analysis a number of alternatives were developed. The objective was to provide a range of road improvements capable of providing acceptable traffic service under future conditions. They varied from very modest operational improvements to more extensive reconstruction of specific intersections or key access links.

Technical Memorandum No. 2[2/] presented a description of the alternatives which were technically feasible, defined the engineering, economic and social characteristics of each and indicated the manner in which each had the potential for satisfying the forecast traffic loads.

After the publication and distribution of each of the two Technical Memoranda described above, meetings were held with the CIA Traffic Advisory Committee to obtain their views on the study findings. The objective was to identify those alternatives which were viable candidates for implementation.

Findings and conclusions of the previous study steps include:

- There is no practical way to improve the Capital Beltway Interchange with George Washington Memorial Parkway to accommodate forecast P.M. peak hour levels of traffic. Service levels at that location will continue to deteriorate for traffic destined from westbound on the Parkway to southbound on the Beltway (Outer Loop). Significantly, about one-fourth of the P.M. peak period trips exiting the CIA Headquarters currently use this route. As traffic volumes increase and service levels deteriorate these trips will seek alternate routes. Long term solutions to this problem must be dealt with in the regional planning process and therefore are beyond the scope of this study.

- Widening of the Cabin John Bridge by the Maryland State Highway Administration (MSHA) and improvements by VDHT on the Virginia approach to the bridge will facilitate the flow of traffic from westbound on the Parkway to northbound on the Beltway (Inner Loop). However, only a small percentage of CIA traffic uses this route.

- Minor improvements are suggested for the CIA entrance road interchange on the GWM Parkway. These will improve safety and operations but will not increase capacity significantly.

2/ ANALYSIS OF ROADWAY IMPROVEMENT ALTERNATIVES FOR THE CIA EXPANSION, Dewberry & Davis and JHK & Associates, February, 1984.

- The Route 123 interchange with the GWM Parkway will eventually need improvement to accommodate a six-lane wide roadway westerly along Route 123. This requirement is not attributable to the CIA expansion and therefore is not dealt with here.

- Seven roadway improvement concepts for the Route 123/Route 193/CIA entrance area were examined. From this group, Alternatives 2 and 4 were selected for Preliminary Engineering Evaluation.

Alternative 4 was endorsed by VDH&T and Fairfax County while the CIA asked that Alternatives 2 and 4 be evaluated. Alternatives 1, 2, 2A and 3 were preferred by the National Capital Planning Commission. No specific position was taken by other representatives on the CIA Traffic Advisory Committee.

The McLean Citizen's Association and the Ad Hoc Committee each developed lists of objectives for the off-site road improvements under study against which the alternatives would be compared. A synthesis of these citizens' views is enumerated below.

1. At the interchange of the George Washington Memorial Parkway and the Beltway, the VDHT improvements should coincide with Maryland's widening of the Cabin John Bridge and should provide an exclusive lane for traffic entering the Beltway from the Parkway in both directions.

2. The Parkway should be improved to accommodate traffic increases from the CIA expansion.

3. Turkey Run Farm Park Road should be enhanced to serve as expanded secondary access to the CIA. Landscaping should be extensive to maintain its suitability as an access road to Turkey Run Farm Park.

4. Route 123 should remain a four-lane highway and Route 193 a two-lane highway.

5. Eastbound Route 123 should be shifted to the north adjacent to existing westbound Route 123 to improve the sight distance at Merchant Lane/Savile Lane and to provide greater distance between the roadway and the adjacent homes.

6. Traffic lights should be provided at the Potomac School Road/Route 123 and the Route 123/Merchant Lane/Savile Lane intersections.

7. Langley Fork should be regraded to provide improved sight distance. Route 193 from the Beltway to Route 123 should have extensive safety improvements.

8. All intersections should be at-grade. If a grade separation is essential, ramps should be no higher than the existing grade of the eastbound lanes of Route 123.

9. The Ad Hoc Committee preferred that the current one-way link between Route 193 and Potomac School Road be eliminated. However, if this is not possible it should remain a one-lane, one-way link.

10. There should be acceleration and deceleration lanes at the intersections of Potomac School Road/Merchant Lane/Savile Lane.

11. There should be no overhead signs.

12. There should be no overhead lights on ramps.

13. Maximum use should be made of berms and landscaping to buffer residential areas from visual or noise impacts of grade separations and lane shifts.

14. Alternatives which require additional rights-of-way should be structured to utilize government lands.

15. If on-site parking becomes a problem for CIA employees, the CIA should discourage its employees from parking off-site, support such local or state legislation and/or ordinances which may be needed to require permit parking in nearby communities, and attempt to obtain authority and funding necessary to expand on-site parking capacity.

CHAPTER II

II. TRAFFIC IMPACTS OF CIA EXPANSION

OVERVIEW OF APPROACH TO THE TRAFFIC ANALYSIS

The purpose of the traffic analysis of the expansion of the CIA headquarters is to determine what highway and traffic facilities will be necessary to serve the added traffic demand. A traffic analysis involves an examination of the relationship of the capacity of a roadway (how much traffic the road can carry) to the traffic demand on that roadway. The term "level of service" is used in the transportation profession to describe how well a road is serving the traffic demand. The purpose of this chapter is to identify traffic problems which will be created by expansion of the CIA headquarters so that appropriate highway improvements can be designed.

The traffic analysis described in this chapter serves to examine the projected impacts of traffic increases around the CIA site through the year 2005. This analysis involved the following steps:

1. Determine existing traffic volumes on roadway facilities within the study area.
2. Determine additional traffic volumes due to CIA expansion. Expansion is assumed to be in effect in 1986.
3. Project future changes in background (non-CIA) traffic.
4. Project total future traffic volumes, including all traffic, under various conditions or scenarios.
5. Conduct a level of service analysis to identify how well existing roadway facilities will be operating under the projected future increases in traffic.

FUTURE CONDITIONS TO BE EXAMINED

In any prediction of the future, there is an element of uncertainty. This, of course, holds true for any prediction of traffic volumes. An important part of conducting a traffic analysis is examining a range of traffic conditions which may occur. The type of improvements required will vary depending on the possible future traffic conditions.

There are three possible conditions to be examined in this study:

1. Future traffic to CIA projected assuming that there is a capacity restraint at the I-495/George Washington Parkway interchange. Currently, the outbound ramps from the Parkway to I-495 operate near capacity in the PM peak traffic period. This condition assumes that, since these ramps are already close to saturation, all CIA expansion traffic would use Routes 123 and 193 to access the site.

2. Future traffic to CIA projected assuming that there is no capacity restraint at the I-495/GW Parkway interchange. In this case, CIA expansion traffic would be distributed similar to the distribution of existing CIA traffic.

3. Future traffic to CIA projected assuming that there is no capacity restraint at the I-495/GW Parkway interchange and that all CIA expansion traffic uses the GW Parkway rather than Routes 123 and 193.

The above conditions were examined for the years of 1986 and 2005 for the AM and PM peak traffic hours.

FORECAST TRAFFIC VOLUMES

Traffic forecasts were prepared by the Virginia Department of Highways and Transportation for the years 1986 and 2005 for the possible future traffic conditions. A number of assumptions were used in establishing these traffic forecasts. These include the following:

1. No growth in background (non-CIA) traffic between now and 1986. The basis for this assumption is the anticipated effect of improved roadway access in the I-66/Dulles Access Road corridor as well as the continued expansion of the Metrorail system.

2. An overall increase in traffic (background plus CIA expansion traffic) of approximately 1.5 percent per year on all roadways within the study area between 1986 and 2005. This rate of growth may be lower or higher for any one roadway in the study area based on its location and impact from CIA traffic.

3. Given no capacity restraints, the distribution of CIA expansion traffic on roadways to and from the site is assumed to be the same as for existing CIA traffic.

4. The amount of additional traffic generated by the CIA expansion is based on the CIA's having implemented measures to contain traffic demand. This results in approximately a 35 percent increase in CIA traffic over existing levels.

The forecast changes in traffic volume were presented in detail in the Technical Memorandum No. 1.

LEVEL OF SERVICE ANALYSIS

Methodology

A level of service analysis is typically employed in a traffic study as a measure of how well roadway facilities are expected to operate under certain traffic and geometric conditions. In such an analysis, the roadways or intersections are assigned a letter rating between A and F, similar to a grade scale in school. An A is a good level of service while an F is a very poor level of service. Normally, one would like the highway system to operate at no worse than level of service D during the peak period. At this point, drivers feel the effects of heavy traffic volumes, but there are no extraordinary delays.

A level of service analysis was performed for the AM and PM peak hours for selected intersections and interchanges in the study area. This initial analysis assumed that there were no improvements to the existing roadway facilities. The purpose of this was to identify where the most significant traffic problems can be expected to occur. Based on this assessment, alternative ways of improving the roadways were developed and additional level of service analyses were performed as a later phase of the study.

Results of the Level of Service Analysis

Technical Memorandum No. 1 indicated the detailed results of the level of service analysis. It pointed out a number of particular locations where the future levels of service are not likely to be acceptable and where improvements are likely to be necessary. These problem areas are illustrated in Figure 2 and are itemized below:

1. Ramp from westbound Parkway to southbound I-495 - this ramp carries a heavy volume in the PM peak period. It is added to a heavy volume on the southbound Beltway and is actually part of a weaving section between the Parkway and the off-ramp to Route 193. This section is nearly operating at capacity now.

2. Ramp from westbound Parkway to northbound I-495 - this ramp merges into a three-lane section of the Beltway just before crossing the Cabin John Bridge. This ramp is also virtually at capacity now. Lanes would need to be added to the bridge for the capacity to be increased.

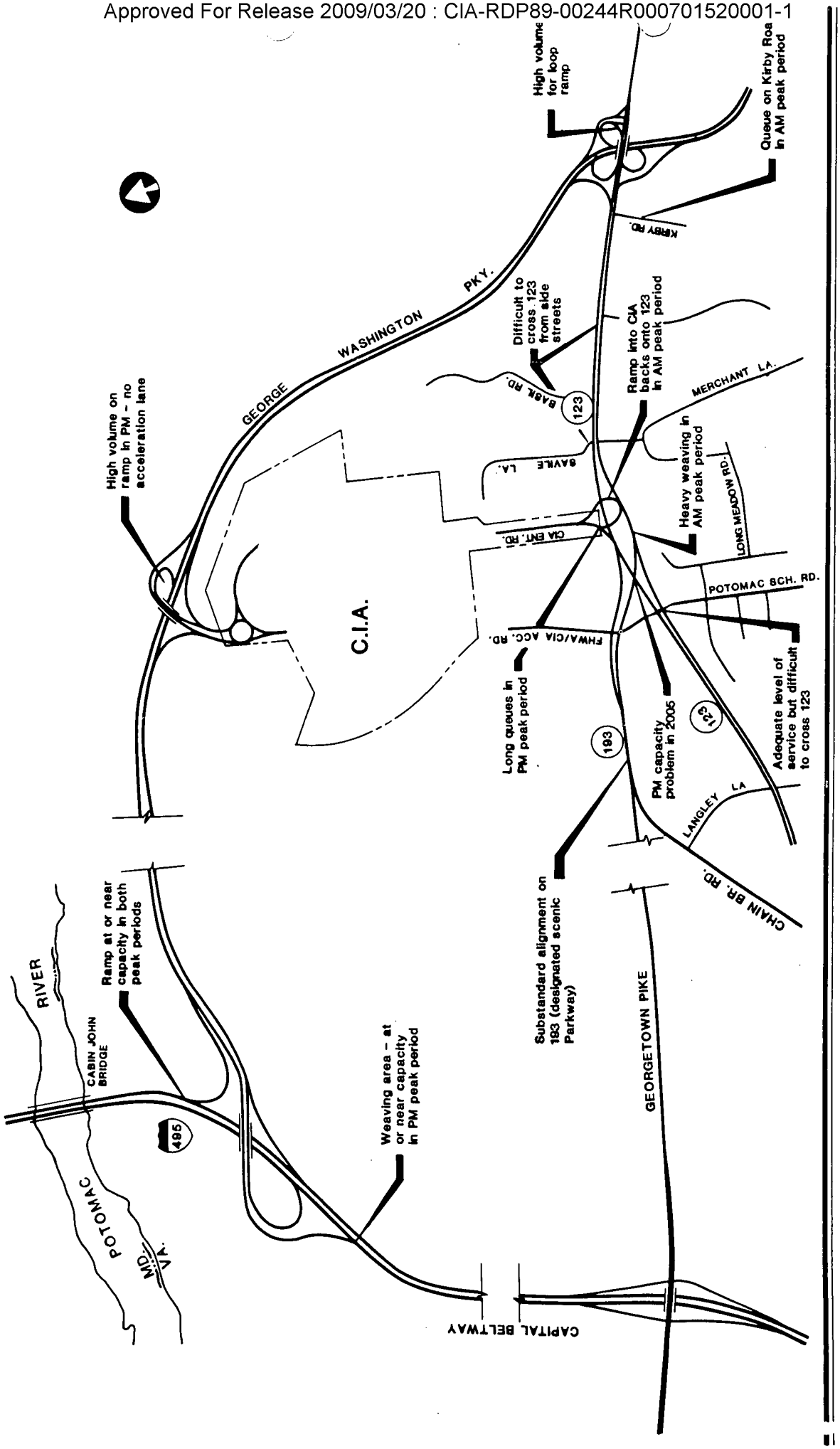


Figure 2

3. Ramps to and from the Parkway at the CIA interchange - the only ramp with traffic operational problems is the ramp from the CIA to the westbound Parkway in the PM peak period. Because of the heavy mainline volume on the Parkway at this time and because there is no acceleration lane for ramp traffic, merges are often difficult to make and the level of service is degraded. Improved operation and increased capacity would result from improving this ramp.

4. Intersection of Route 123 and the CIA main entrance - the level of service at this intersection is marginally adequate. Queues are generally contained on the CIA premises, the primary exception to this being in the AM peak period when queues extend from the signal at the CIA entrance back to the Route 123 eastbound roadway. This queue sometimes conflicts with vehicles merging onto Route 123 from southbound Route 193 in the AM peak period. The improvement of this weaving area is a problem which needs to be addressed. The queue out of the CIA headquarters in the PM peak period is long, but generally is moving at a steady pace, with relatively short delays to any one vehicle. As volume is added to this exit, however, green time may need to be taken from Route 123, which will cause the level of service on Route 123 to deteriorate.

5. Intersection of Route 193 and the Turkey Run access road - this intersection currently operates very well, with moderate queues out of the CIA in the PM peak period. Some minor modifications to this intersection could allow it to operate well for many years in the future. The rest of Route 193 to the north, which is primarily two lanes, was not originally designed to handle the amount of traffic it is carrying and should be considered for safety upgrading. There are plans to make such an upgrading without increasing the number of lanes on the road itself.

6. Other intersections along Route 123 - several other intersections being evaluated along Route 123 are at Potomac School Road, Route 193 and Kirby Road. There is no level of service problem at Potomac School Road, but there is a problem with being able to cross heavy streams of Route 123 traffic in the peak periods. This problem occurs at other unsignalized intersections with Route 123 as well, such as Merchant Lane. There is also no easy access from Potomac School Road (or from eastbound Route 123) to westbound Route 193. Currently, vehicles must go down to the CIA/123 intersection and make a U-turn back to Route 193. The intersection of Route 193 and Route 123 operates acceptably except for the year 2005 in the PM peak period. At Kirby Road, there is generally a long queue approaching Route 123 in the AM peak period. In the PM peak period there are typically no problems at this location.

The impact of the CIA expansion will be most apparent where traffic enters the CIA from the Parkway and Route 123. Here, it is the expansion traffic that would be the primary cause for any traffic improvements needed. At other locations, the cause of the traffic problems is less obvious. Improvements to the Parkway interchange with the Beltway will be needed with or without the expansion traffic. Several

intersections along Route 123 will eventually need improvement even without the CIA expansion traffic. However, the expansion traffic is likely to make these improvements necessary at an earlier date. Specific improvements and their potential effects are discussed in Chapter 3.

CHAPTER III

III. DEVELOPMENT AND EVALUATION OF PRELIMINARY ALTERNATIVES

INTRODUCTION

The analysis presented in Chapter 2 indicated the need for development of action-oriented transportation improvements. In developing these improvements it must be kept in mind that long range highway planning is normally carried out on a regional basis. On the other hand, transportation planning related to an individual site would generally deal with direct access to the site. However, given the location of the CIA adjacent to several major regional facilities, it is difficult to totally separate CIA access needs from separate, but related regional needs. Though in some cases these needs overlap, it is important that the two requirements be kept clearly in mind.

The alternatives addressed in this chapter are oriented to improving access to the CIA which in turn will permit the regional highway facilities in this area to function at reasonable service levels. A number of alternatives have been developed which range from "do nothing" or very modest operational improvements to more extensive reconstruction of particular intersections or key access links.

The purpose of this chapter is to identify a number of preliminary alternatives and to determine those which are technically feasible, define their basic engineering, economic, and social characteristics, indicate the manner in which they would satisfy the forecast traffic loads and graphically depict how they would be incorporated into the existing road network. After examining the characteristics of these improvements two of the candidates were selected for further review. Following a discussion of programmed roadway improvements, improvement alternatives are discussed for the three major analysis areas: the Capital Beltway/GWMP interchange, the CIA/GWMP interchange and Route 123 between the CIA and Potomac School Road.

PROGRAMMED ROADWAY IMPROVEMENTS

Two significant improvements to the Capital Beltway are currently programmed by the Virginia Department of Highways and Transportation (VDH&T) and the Maryland State Highway Administration (MSHA) which will have an influence on the alternatives being evaluated. These improvements are:

- **Cabin John Bridge** - VDH&T and MSHA have programmed the widening of the Cabin John Bridge to provide four lanes in each direction with shoulder areas for disabled vehicles. A 4-F statement for this project has been completed and design is underway. Funds for construction have been programmed with completion scheduled for 1986. Consequently, this project has been accepted as a given when formulating and evaluating alternatives.

- **Capital Beltway from GWMP to the Cabin John Bridge** - A related roadway improvement will be constructed by VDH&T. This will involve the widening of the present Beltway inner and outer loops so that four through lanes are provided continuously between the George Washington Memorial Parkway and the Cabin John Bridge. This project is also accepted as a given in the study although the potential consequences on traffic flows are described.

- **George Washington Memorial Parkway** - The National Park Service has abandoned plans for extending the GWMP beyond the Beltway. Right-of-way acquired for this purpose is being disposed of; therefore, no consideration of the possible extension of the GWMP outside the Beltway was given in this study.

ROADWAY IMPROVEMENTS EXCLUDED FROM CONSIDERATION

George Washington Memorial Parkway

Capacity restraints at the GWMP Interchange with the Beltway impose limitations on the volume of traffic which can enter the Beltway from the Parkway. The only way to remove these restraints would be to again widen the Beltway beyond reasonable and practical limits. This factor, combined with the abandonment of plans for extending the Parkway outside the Beltway, preclude consideration of widening the Parkway from Route 123 or the CIA entrance north to the Beltway since such a widening would not increase capacity at the most critical points and would thus be of no benefit.

Route 193 (Old Georgetown Pike)

Old Georgetown Pike has been designated a Virginia Historic Byway. Plans have been prepared for safety upgrading of the road but no increased capacity will result. Under these circumstances, widening of Route 193 was not considered as a viable candidate for consideration in this study. However, providing a grade separation between eastbound Route 193 and westbound Route 123, a past and future objective of VDH&T, was thoroughly investigated.

the Beltway between the GWMP and Route 193 interchanges would be required in order to eliminate the weaving of traffic exiting at Route 193. This concept would require replacement of the Service Road bridge over the Beltway since insufficient clearance is available to permit the modification required and would involve relocation of Live Oak Drive with attendant significant costs and disruption.

Comparison of Alternatives

Under virtually any improvement alternative, the interchange of I-495 with the George Washington Parkway will continue to experience severe traffic problems into the future. Although the current problems on I-495 northbound can be alleviated somewhat through the forthcoming Cabin John Bridge widening project, such is not true for the weaving area on I-495 southbound between the Parkway and Route 193. Several major improvements to the southbound direction were considered, including an additional auxiliary lane and a braided exit ramp configuration to eliminate weaving traffic. However, the costs and probable right-of-way and environmental impacts of these options are significant when compared to the small benefit obtained.

The southbound direction of I-495 between the Parkway and Route 193 should receive further study in the context of the overall regional transportation network. It is likely to become one of the major bottlenecks on the Beltway in the future if alternate routes are not constructed or if some other major improvements are not made. One important observation is that any configuration on the Beltway that does not allow for an exclusive lane from the Parkway will result in congestion on the Parkway which is much more severe than exists at that interchange today. This should be a significant consideration in the final design of the southbound Cabin John Bridge project and its integration with the Parkway interchange.

Presented in Tables III-1 is a quantitative and qualitative comparison of the roadway improvement alternatives considered at the Beltway/GWMP Interchange. This provides a basis for comparing the various alternatives in a broad range of categories ranging from costs, which can be quantified, to environmental consequences, which are qualitative in nature. In addition to the table summarizing the impacts, the following conclusions are offered:

Table III-1. Comparison of Alternatives - Capital Beltway/GWMP Interchange

ALTERNATIVE	DESIGN FEATURES	SERVICE LEVEL AT SELECTED LOCATIONS	COST[1/] (Million Dollars)	R-O-W REQUIREMENT	SITE COMPATIBILITY	IMPACTS ON TRAFFIC DURING CONSTRUCTION
1	4 thru lanes on Beltway with acceleration and deceleration lanes	N.B. Ramp - Unsatisfactory S.B. Ramp - Unsatisfactory Capital Beltway Roadways Inner Loop - Marginal Outer loop - Unsatisfactory	$0.9	None	Good	Moderate
2	4 thru lanes on Beltway with auxiliary lane on outer loop between GWMP and Route 193	N.B. Ramp - Adequate S.B. Ramp - Unsatisfactory Capital Beltway Roadways Inner Loop - Marginal Outer Loop - Unsatisfactory	$2.0	None	Good	Moderate
3	4 thru lanes on Beltway with auxiliary lanes between ramps and dual exit ramp to Route 193	N.B. Ramp - Adequate S.B. Ramp - Unsatisfactory Capital Beltway Roadways Inner Loop - Marginal Outer Loop - Unsatisfactory	$4.5	Extensive	Unsatisfactory	Significant

1/ Does not include cost of widening Cabin John Bridge already programmed by VDH&T & MSHA.

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

- The currently programmed rehabilitation and deck widening on the Cabin John Bridge will enhance traffic operations over the short term. Ultimately, it will be necessary to provide four through lanes plus an auxiliary lane for maneuvering vehicles northbound across this Bridge as indicated by Alternative 2 in order to maintain satisfactory service levels.

- The examination of traffic operation at the I-495/G.W. Parkway interchange indicated a serious deficiency in future capacity on I-495 southbound between the Parkway on-ramp and the Route 193 off-ramp. This deficiency is attributable more to overall traffic growth than to the CIA expansion. This is a problem which is regional rather than localized in scope and measures required to provide adequate capacity to accommodate normally acceptable levels of service are of a scale which is outside the scope of this study. Therefore, no further analysis of these alternatives will be performed.

GWMP/CIA Entrance Interchange - (Figure 6)

Upgrading of the entrance ramps to the Parkway is suggested. Involved is widening the northbound GWMP on the median side and utilizing the existing right lane of the outbound Parkway as an acceleration lane. Also required is widening along the right side of the GWMP southbound ramp to provide an adequate acceleration lane. The conclusions of the analysis of this section of the GWMP are summarized below:

- Absence of an effective way to terminate a 6-lane GWMP at the Beltway, together with abandonment of plans for extending the Parkway outside the Beltway preclude consideration of widening the Parkway north of Route 123, as it would be of no practical benefit.

- Upgraded design of the entrance ramps linking the CIA access interchange with the Parkway should be undertaken at a cost of $400,000. These will improve safety and upgrade operating characteristics at this location.

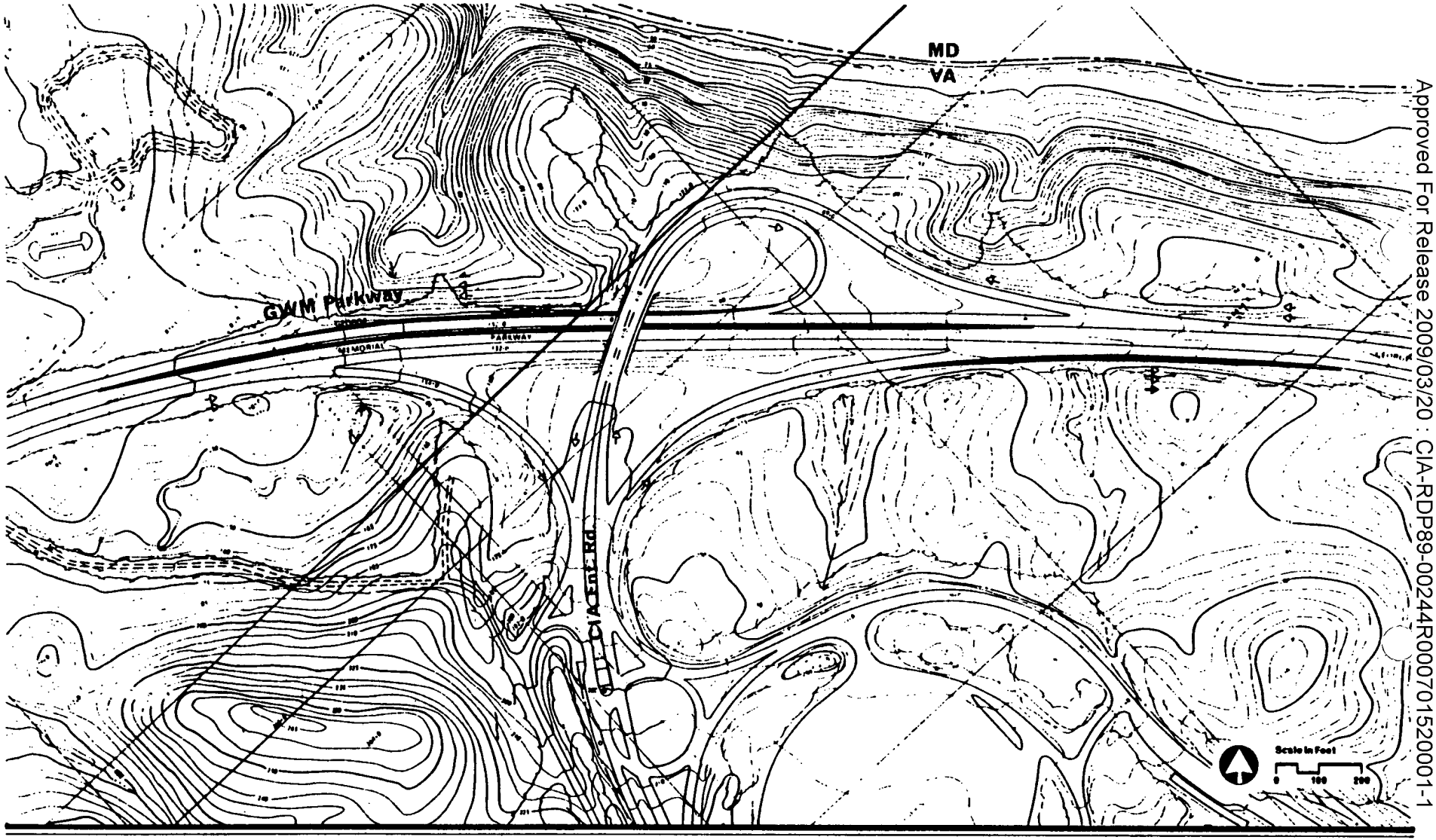


Figure 6

LEGEND
Proposed Roadway
Exist. Roadway to be Maintained

ALTERNATIVE 1
Improvements to CIA Access Interchange with GWM Parkway

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

ROUTE 123/ROUTE 193/CIA ENTRANCE

Improvement Alternatives

Seven preliminary alternatives were evaluated for the segment of Route 123 from Potomac School Road to Merchant Lane, which includes the CIA entrance from Route 123. Improvements to the FHWA/CIA (Turkey Run Farm) Access Road at Route 193 and three lanes in each direction along Route 123 within these limits are elements of all alternatives.

Alternative 1 - Basic At-Grade Improvements - (Figure 7)

Alternative 1 represents the lowest level of improvements evaluated as a candidate to provide improved service levels along Route 123 at the CIA entrance. In general, this scheme involves widening of existing roadways to provide additional through and turning lanes. However, the connection between Routes 123 and 193 would be realigned westerly to increase the length of the weaving and merging areas between Route 193 and the CIA entrance intersections. No operational improvement of the existing Potomac School Road intersection would be provided although a direct connection from Potomac School Road to westbound 193 is possible.

Alternative 2 - At-Grade T Intersections (Figure 8)

This concept would involve realignment and reconstruction of most of the existing roadways to provide two conventional T-intersections with signal controls. Multiple turning lanes would be provided where required to achieve adequate levels of service. The signal installations would be interconnected to provide optimum efficiency. The Potomac School Road intersection would be aligned opposite relocated Route 193 which would afford opportunity for signal control of all turning movements and for pedestrian crossings. The existing roadways not affected would be westbound Route 123 and the CIA entrance road, although both would require widening.

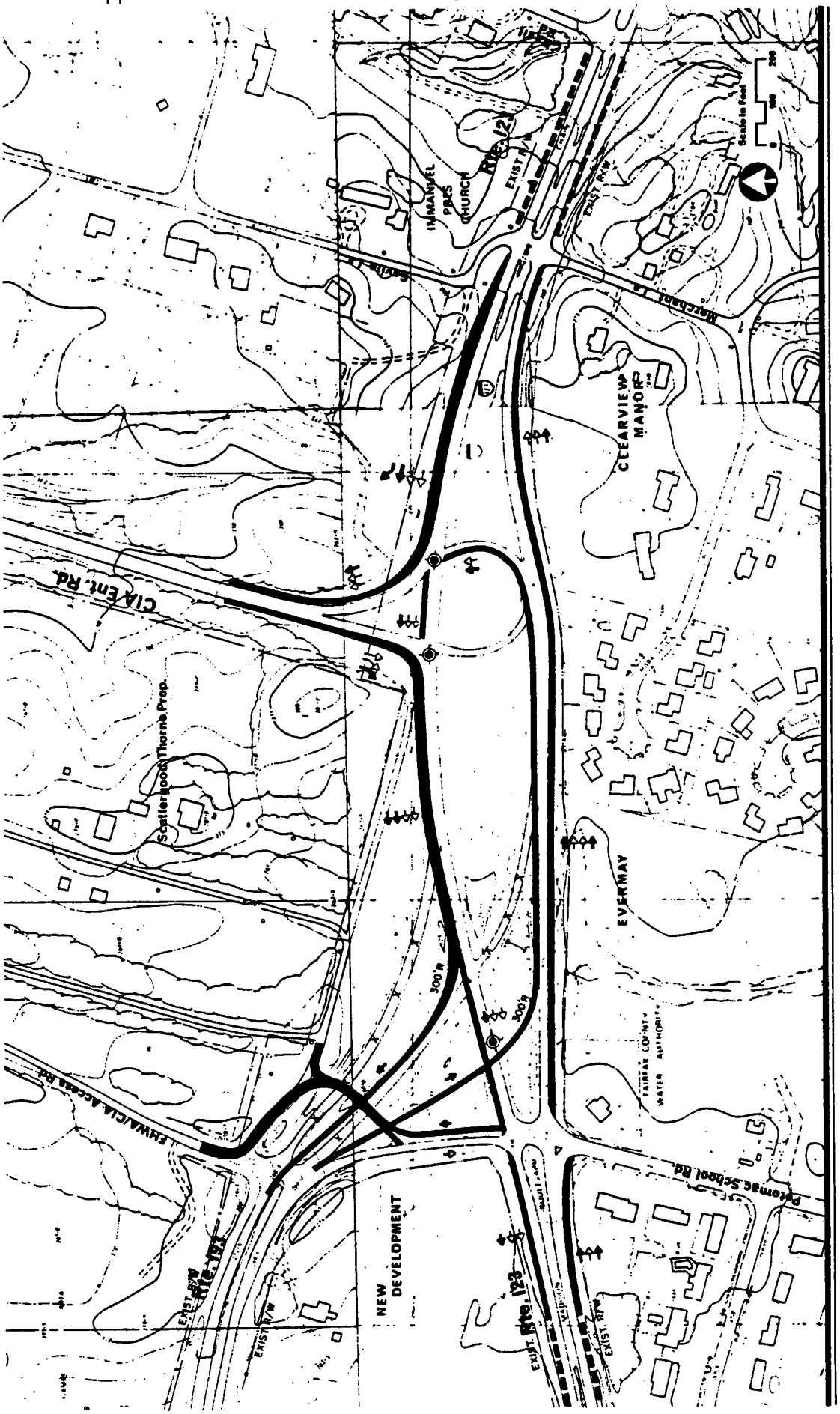


Figure 7

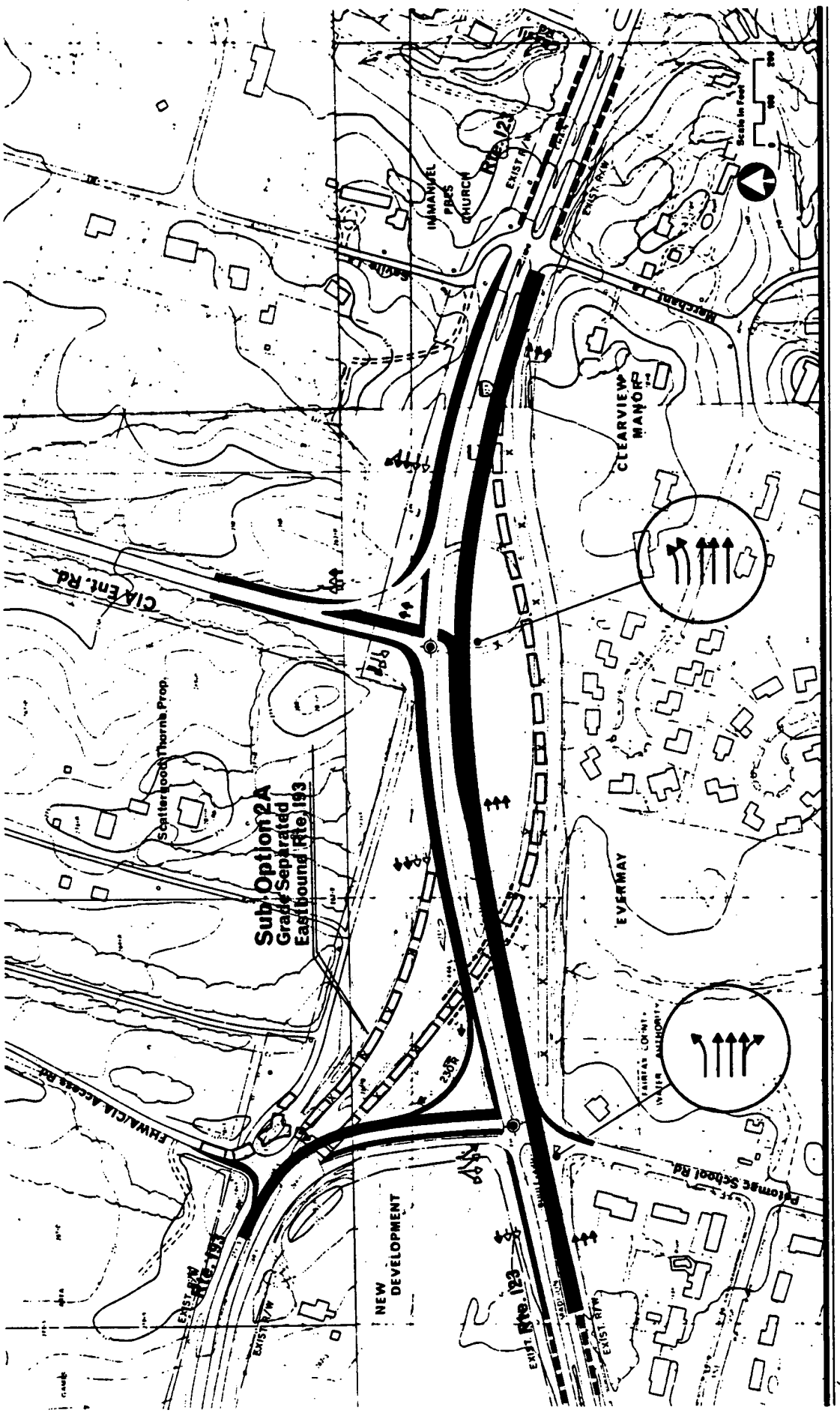


Figure 8

Alternative 2A - (Figure 8)

With this scheme Alternative 2 would be modified to incorporate a grade separation between Eastbound Route 193 and Westbound Route 123, consistent with past and future planning objectives for the Virginia Department of Highways and Transportation. The CIA entrance intersection would be the same as with Alternative 2. The Potomac School Road intersection at Route 123 would not be signalized, similar to Alternative 4.

Alternative 3 - Trumpet Interchange Option 1 (Figure 9)

This alternative would involve construction of a trumpet interchange between Route 123 and the CIA entrance road. Route 193 would be realigned to intersect Route 123 opposite Potomac School Road. This intersection would require signal control. A single grade-separation carrying Route 123 over the ramps in and out of the CIA complex would be provided.

Alternative 4 - Trumpet Interchange Option 2 (Figure 10)

This concept is similar to Alternative 3 except that the loop ramp configuration is reversed. This would permit a grade separation between the eastbound Route 193 and westbound Route 123 roadways. This advantage is offset by the reduced weaving distance on Route 123 westbound between the CIA exit and Route 193 and by the somewhat reduced geometric design standards which would be required to minimize grade changes and right-of-way requirements. No signal would be required at the Route 123 intersection with Potomac School Road.

Alternative 5 - Three-Bridge Option (Figure 11)

This scheme involves realignment of the Route 193 connections to Route 123, realignment of the access ramps to the CIA, and the grade separation of these three connections from the westbound Route 123 roadway. Both directional roadways of Route 123 would be widened and the merging and weaving distances along eastbound Route 123 would be increased. The Potomac School Road intersection with Route 123 would be retained.

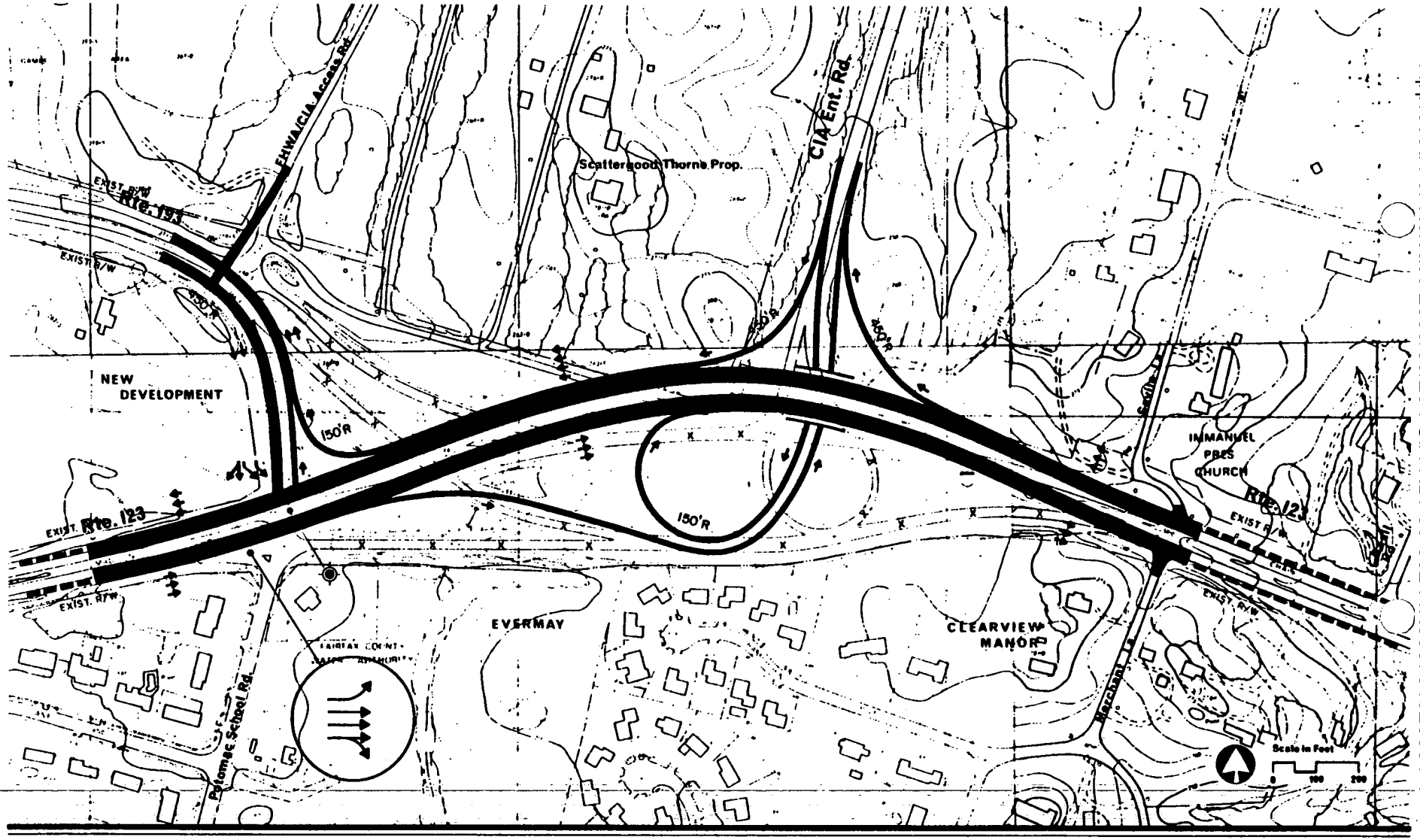


Figure 9

LEGEND
- Proposed Roadway
- Exist. Roadway to be Maintained
- Traffic Signal
- Abandoned Roadway
- Ultimate Widening Outside Study Limits

ALTERNATIVE 3
Route 123/Route 193 CIA Entrance

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

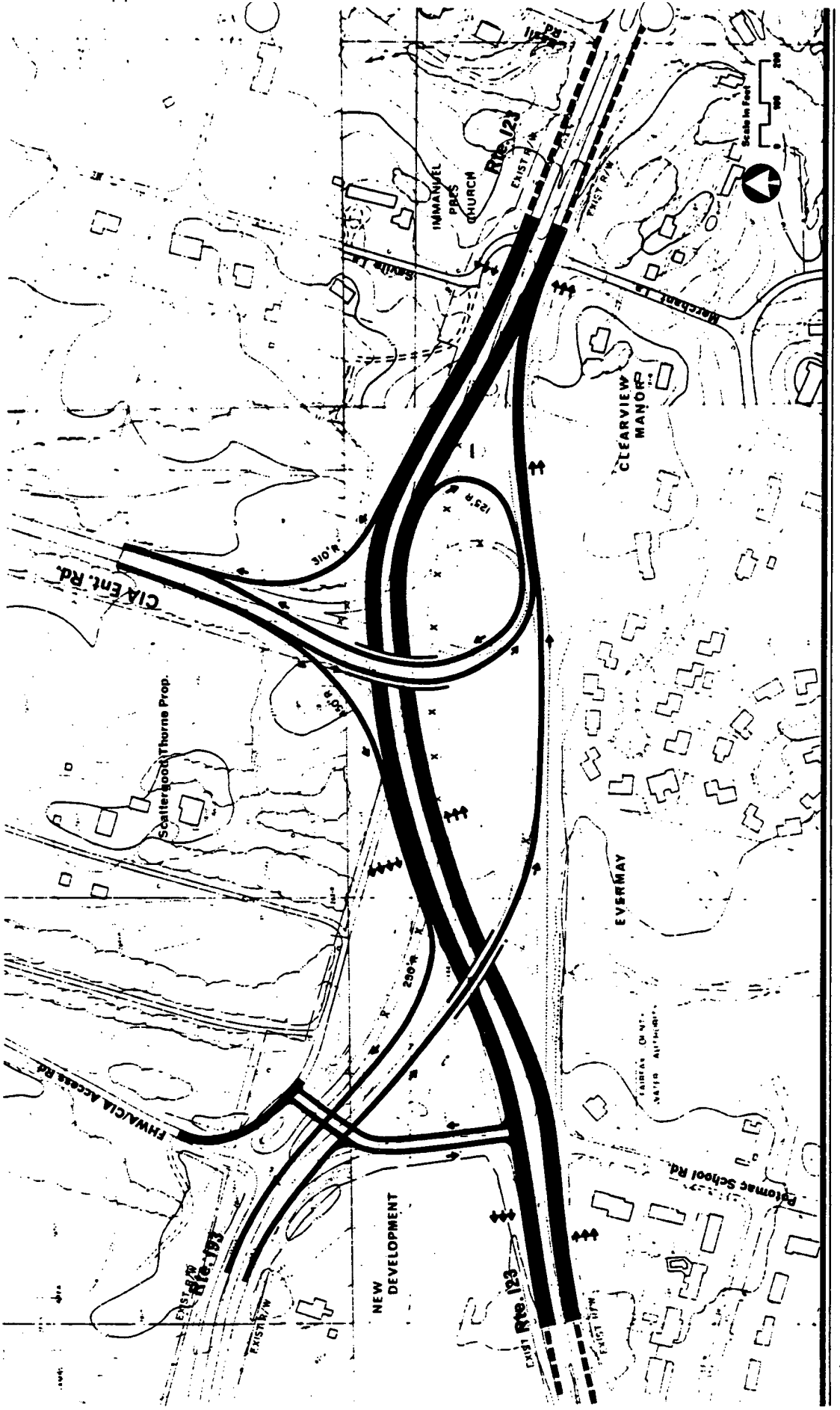


Figure 10

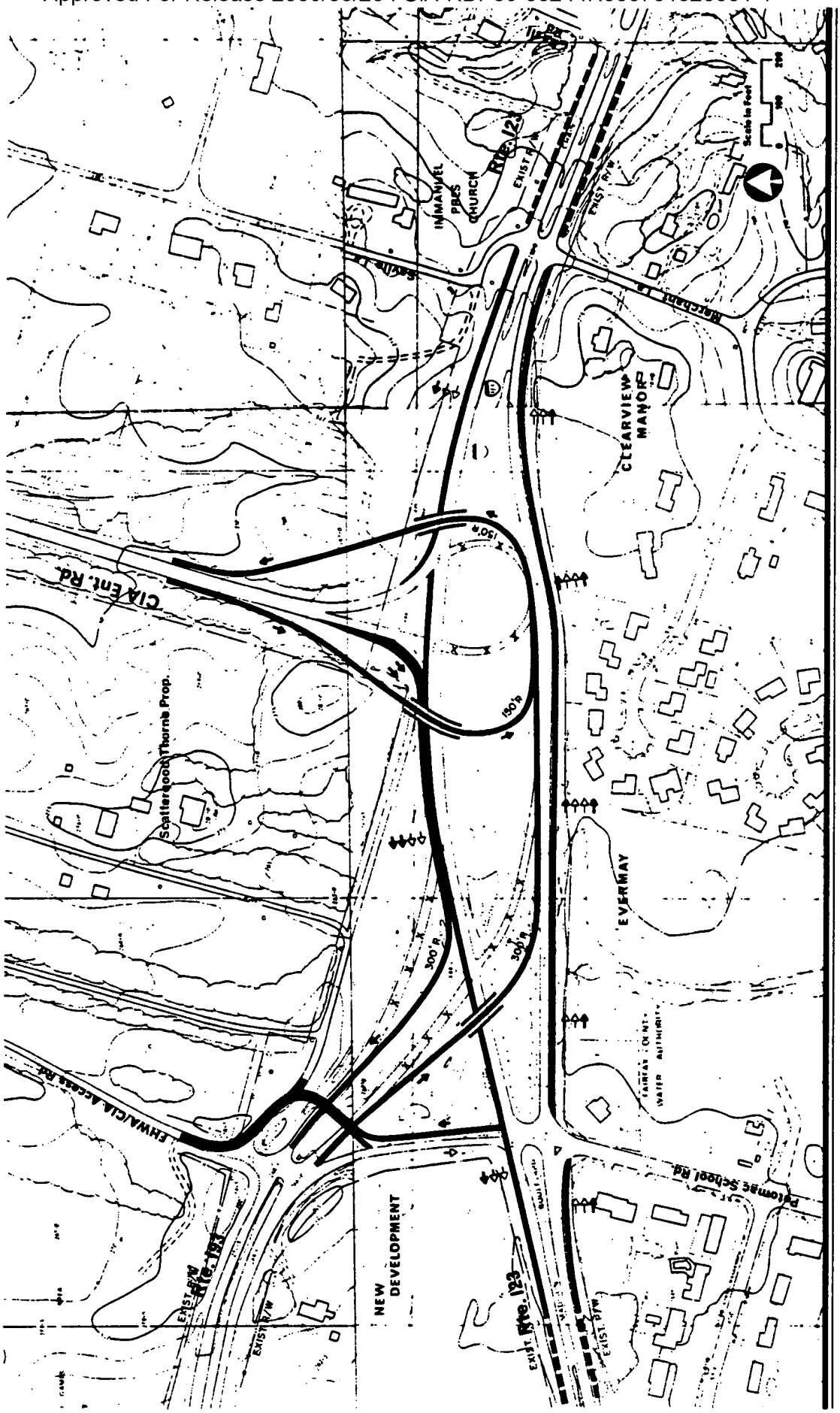


Figure 11

Alternative 6 - Tri-Level Bridge Option (Figure 12)

This scheme involves a multi-legged, complex interchange with grade separations to eliminate all grade crossings and most weaving between traffic entering and leaving Route 123 to the CIA or to Route 193. A three-level grade separation would be involved. The Potomac School Road intersection at Route 123 would be limited to right turns in and out. This would result in rerouting of local trips via subdivision streets to the Merchant Lane intersection, a significant disadvantage. This scheme and Alternative 7 represent the range of highest cost and most complexity when compared with the other alternatives.

Alternative 7 - (Figure 13)

This concept is a variation of Alternative 6 that permits realignment of Route 193 opposite Potomac School Road and therefore allows retention of and improvement to this intersection. This concept is also an extreme measure compared to the at-grade alternatives.

Comparison of Alternatives

The basic conclusion of the analysis of Route 123 and its intersections with the CIA, Route 193 and Potomac School Road is that any of the options, including the at-grade options with a 6-lane Route 123, could effectively accommodate traffic demand, even the capacity-restrained condition. However, the at-grade options are not as flexible as the grade separated options since they are predicted to operate at marginally acceptable levels of service, and could not be easily upgraded should the traffic volumes prove to be higher than the projections. The primary advantage of the grade-separated alternatives over the at-grade alternatives is in the reduced traffic delay incurred. Traffic will incur less delay with the grade separated alternatives since there will be fewer traffic signals and therefore a lower probability of stopping. The primary trade-off, of course, is the substantially greater costs of the grade-separated alternatives. Under any of the alternatives, problems crossing Route 123 will continue to exist at Merchant Lane and at Potomac School Road under unsignalized conditions.

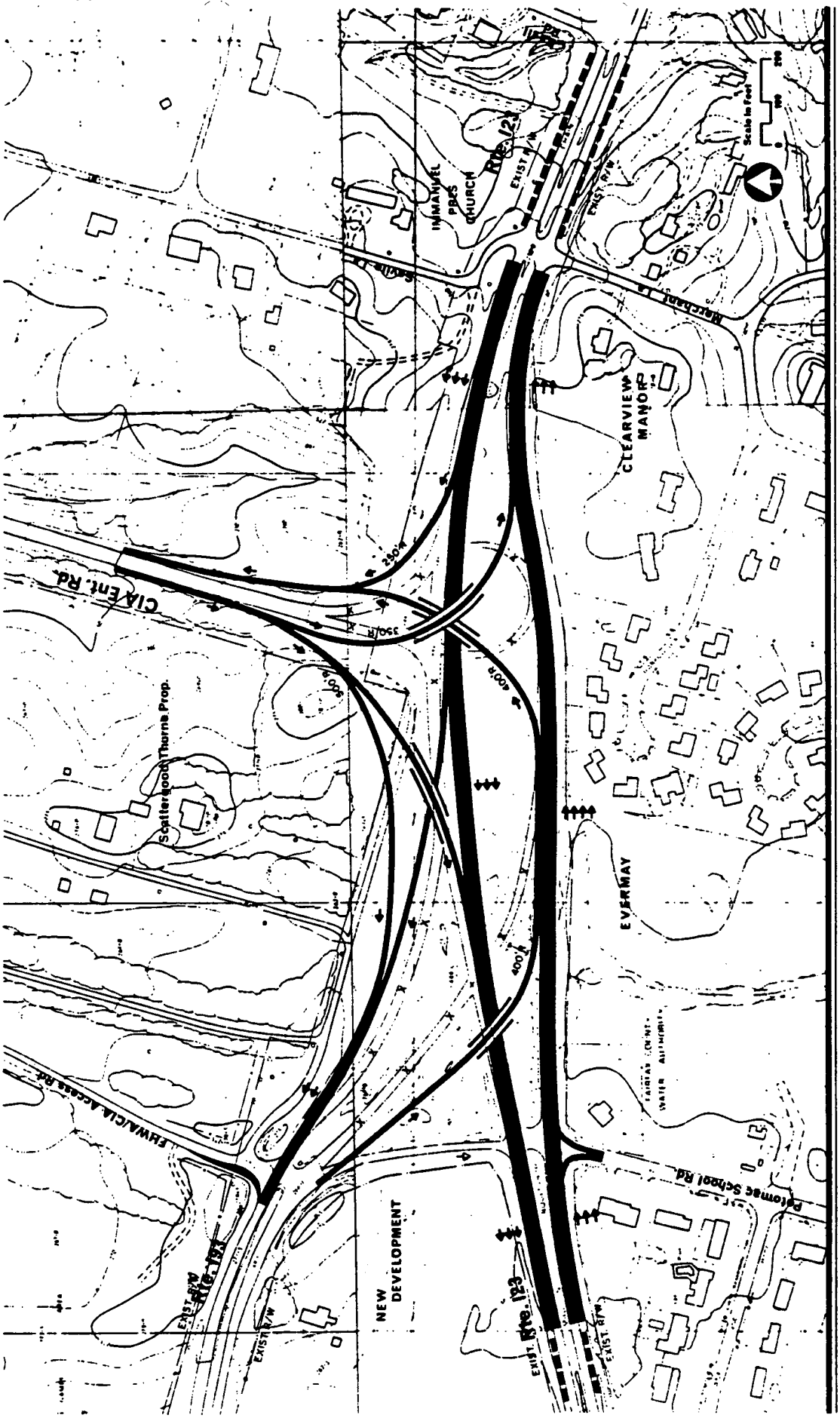


Figure 12

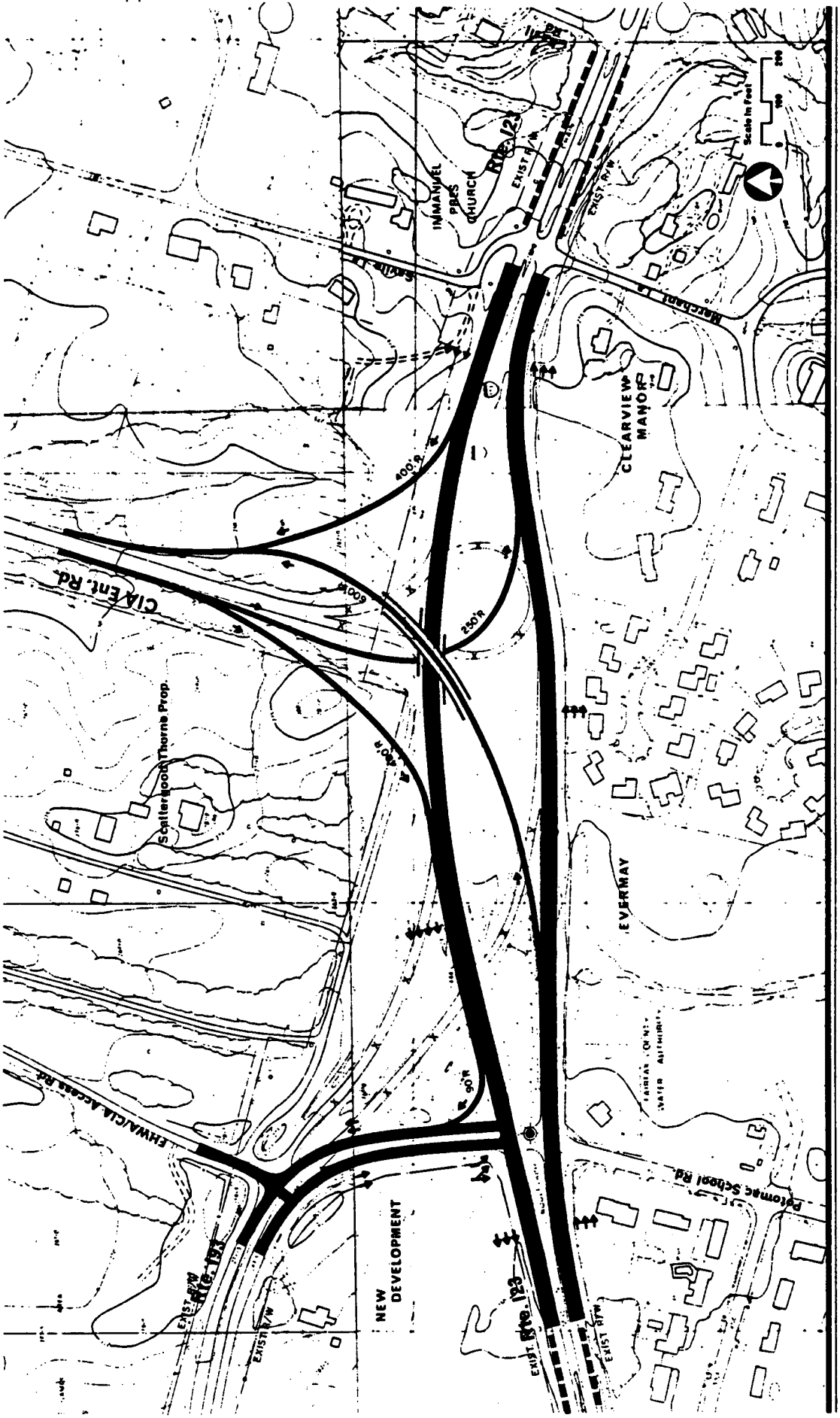


Figure 13

The following summarize the important findings for each of the improvement alternatives along Route 123:

- At-grade Alternative 1 -
  - provides C-D level of service with 6-lane section of Route 123, with a marginally acceptable level at the CIA entrance
  - weaving area on eastbound Route 123 between Route 193 and the CIA entrance may still be a problem
  - intersection with Potomac School Road still poses safety problems, unless signalized.
- At-grade Alternative 2 -
  - provides C-D level of service with 6-lane section of Route 123, with marginally acceptable levels at both intersections
  - the intersection with Potomac School Road becomes a major focal point of traffic flow. Delays will significantly increase for Route 193 eastbound traffic, which is diverted through the Potomac School Road intersection. Although traffic through this intersection would increase, it has the advantage of providing greater safety and accessibility for Potomac School Road traffic and for pedestrians
  - only this alternative and alternatives 3, 4 and 7 eliminate the AM weaving problem on eastbound Route 123
- Alternative 2A -
  - alleviates the most significant problem with Alternative 2 by providing a grade separation of Route 193 and Route 123
  - otherwise is the same as Alternative 2
- Grade-separated Alternative 3 -
  - this trumpet interchange option has the advantage of providing a good level of service at the CIA entrance and also solving some of the accessibility and safety problems at Potomac School Road. The level of service at Potomac School Road is only marginally acceptable, however. The major remaining traffic problem is the westbound weaving section between the CIA and Route 193.
- Grade-separated Alternative 4 -
  - provides improved level of service for Route 193 traffic and at Potomac School Road over Alternative 3
  - retains short weaving section on westbound Route 123

- Grade-separated Alternative 5 -

  - the two major remaining problems with this alternative are the weaving sections northbound and southbound between Route 193 and the CIA. A six-lane section is still needed to accommodate the weaving volumes, and these will operate no better than the weaving sections under the at-grade options.

  - this option retains the safety and accessibility problems at Potomac School Road. The crossing problem for both vehicles and pedestrians could be solved only with a traffic signal, which would interrupt flow on Route 123.

- Grade-separated Alternatives 6 and 7

  - These alternatives, which grade-separate traffic movements in a different manner than the other alternatives, retain one or more of the same deficiencies as the other alternatives. In the case of Alternative 6, the eastbound weaving section is the shortest of any of the seven options. For Alternative 7, the westbound weaving section is retained.

  - as with the other grade-separated options, Alternatives 6 and 7 would reduce traffic delay through the elimination of traffic signals but would incur substantially greater costs than the at-grade options and with more right-of-way impact.

Table III-2 presents a quantitative and qualitative comparison of the roadway improvements alternatives considered along Route 123. An overview of the conclusions is presented below:

- Increased traffic resulting from the CIA expansion, in conjunction with overall traffic growth, warrant improvements along Route 123. All of the alternatives which were evaluated will theoretically accommodate the projected traffic condition volumes for the year 2005. However, Alternatives 1 and 2 which involve only at-grade improvements are limited in their ability to handle traffic by the at-grade signalized intersections. Small increases in traffic volumes beyond those forecasted to occur could result in inadequate service levels at the critical intersections.

- The alternatives which include grade separations provide considerable additional capacity at the CIA entrance and, therefore, are more flexible in their ability to provide adequate service should traffic exceed levels forecasted for the capacity restrained condition. However, some of the grade separation alternatives retain a major at-grade intersection.

CHAPTER IV

Table III-2. Comparison of Alternatives

Route 123/Route 193/CIA Entrance

ALTERNATIVE	DESIGN FEATURES	SERVICE LEVEL AT ROUTE 193 INTERSECTION WITH ROUTE 123	SERVICE LEVELS AT OTHER SELECTED LOCATIONS	COST (Million Dollars)	R-O-W[1/] REQUIREMENT	COMPATIBILITY	ACCOMMODATIONS FOR PEDESTRIANS	IMPACTS ON CIA INTERNAL ROADWAYS	IMPACTS ON TRAFFIC DURING CONSTRUCTION
1	Basic at grade improvements	Marginal	CIA - Marginal Potomac School Rd. - Adequate	$1.1	None	Good	Unchanged	None	Moderate
2	"T" intersections at grade	Marginal	CIA - Marginal[2/] Potomac School Rd. - Adequate	$1.5	None	Good	Improved	None	Moderate
2A	"T" intersections at grade with grade separation of Eastbound 193 with Westbound 123	Adequate	CIA - Marginal Potomac School Rd. - Adequate	$2.3	None	Good	Improved	None	Moderate
3	Trumpet interchange at CIA, major at grade intersection at Potomac School Rd.	Marginal	CIA - Adequate Potomac School Rd. - Adequate	$4.4	Minimal	Acceptable	Improved	Moderate	Significant
4	Trumpet interchange which also includes grade separation of Eastbound 193 and Westbound 123	Adequate	CIA - Adequate Potomac School Rd. - Adequate	$5.1	Minimal	Acceptable	Unchanged	Moderate	Significant
5	Three bridge option: grade separation for CIA entering and exiting ramp and Southbound Route 193	Adequate	CIA - Adequate Potomac School Rd. - Adequate	$3.7	Minimal	Questionable	Unchanged	Significant	Moderate
6	Tri-level grade separation: no weaving	Superior	CIA - Superior Potomac School Rd. - Inadequate	$5.7	Significant	Unsatisfactory	Downgraded	Significant	Extensive
7	Tri-level grade separation with at grade intersection at Potomac School Rd.	Adequate	CIA - Adequate Potomac School Rd. - Adequate	$5.9	Significant	Unsatisfactory	Unchanged	Significant	Extensive

1/ Alternatives 1 and 2 avoid encroachment on Scattergood Thorne Property - all others would have an impact.

2/ Service levels same as 1 but overall traffic operation and layout is superior. This is preferred at-grade solution.

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

- Concentrating traffic movements at the Potomac School Road/Route 193/Route 123 intersection will result in considerable delays for some traffic movements when compared with travel times associated with the grade separated options, because of the multiple phase signals which would be required.

- Route 123 is classified as an Urban Principal Arterial and Federal Aid Primary highway. Route 193 is an Urban Minor Arterial under the Federal Aid Urban Program. An objective of the regional planning agency is to grade separate and provide interchanges in locations where these road classifications intersect. Right-of-way was originally purchased by VDH&T in order to eventually provide a grade separation between eastbound Route 193 and westbound Route 123. Any alternative which fails to include a grade separation between Routes 123 and 193 could therefore be considered as not in compliance with the regional planning agency goals or with previous planning of the VDH&T.

- Higher cost, human and environmental impacts and general site incompatibility preclude Alternatives 6 and 7 from further consideration.

The seven alternatives for improvement to Route 123 in the vicinity of the CIA were closely reviewed by the CIA, VDH&T and the members of the Traffic Advisory Committee. A meeting involving all parties was held to select the Route 123 alternatives that should be candidates for further detailed study. As described in Chapter 1, Alternatives 2 and 4 were selected as the ones for further consideration. Chapter 4 contains a more detailed evaluation of the two remaining alternatives plus one sub-option for each.

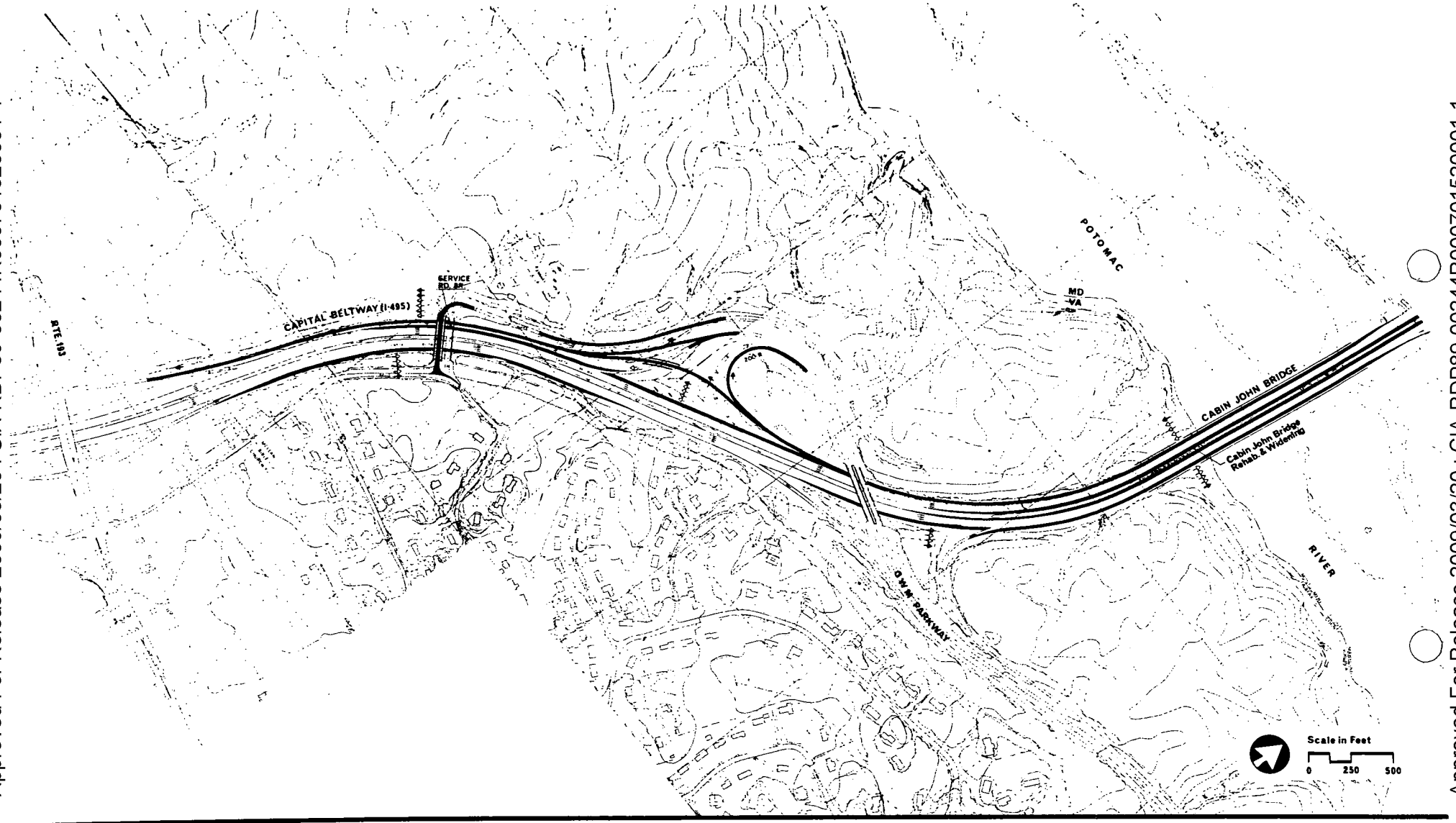
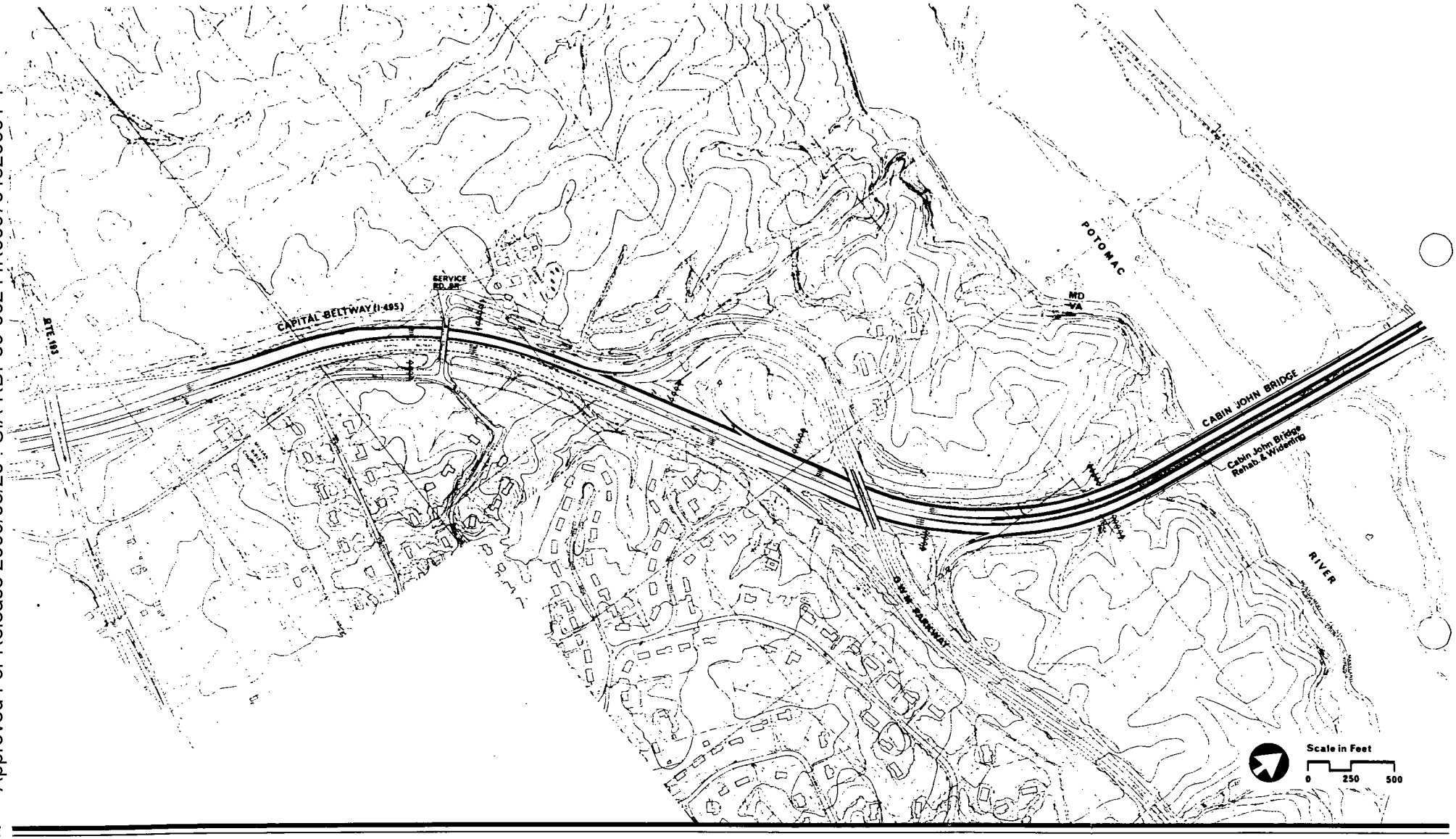


Figure 5

LEGEND
- Proposed Roadway
- Exist. Roadway to be Maintained
- X X X Abandoned Roadway

ALTERNATIVE 3
Capital Beltway (I-495) Interchange With GWM Parkway

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1



LEGEND

- Proposed Roadway
- Exist. Roadway to be Maintained
- X X X Abandoned Roadway

Figure 4

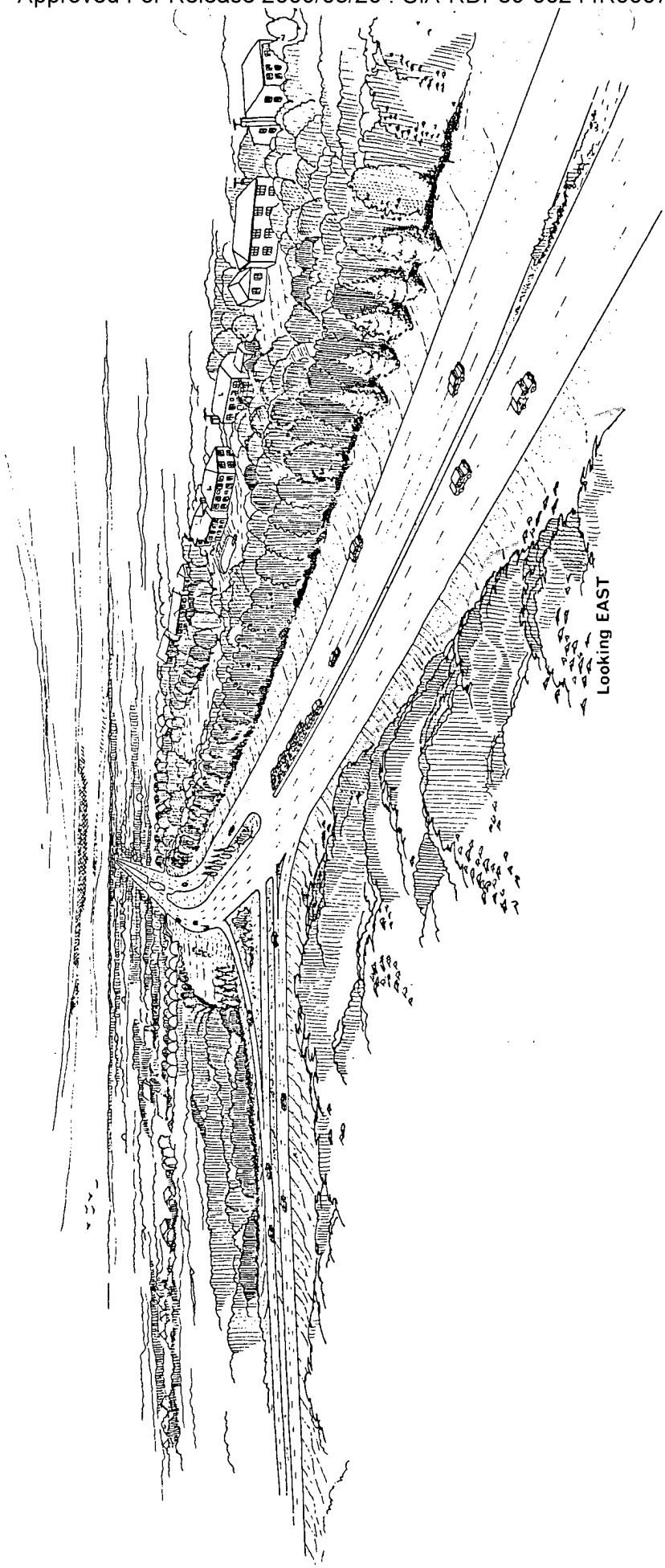
ALTERNATIVE 2

Capital Beltway (I-495) Interchange With GWM Parkway

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

ALTERNATIVE 2
Route 123 • Route 193•CIA Entrance

Figure 14



ALTERNATIVE 2
Conceptual View
Route 123 at CIA Entrance

Figure 14A

Alternative 4

Alternative 4, illustrated on Figure 15, again relocates the eastbound lanes of Route 123 to the north, adjacent to the westbound lanes. Route 123 would have three lanes in each direction.

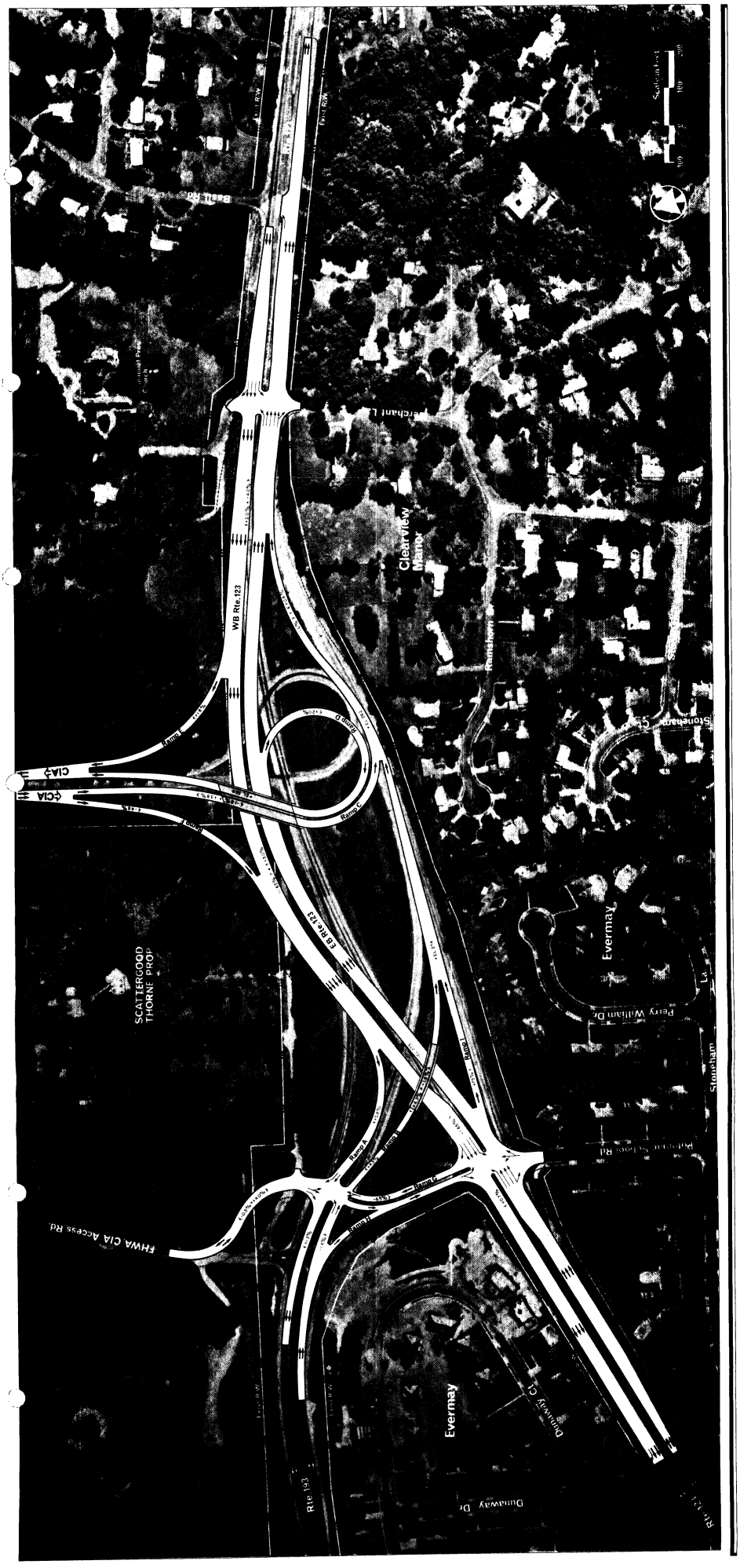
Three traffic movements are grade separated. At-grade left turns into and out of the CIA are eliminated and replaced with ramps that overpass Route 123 in the vicinity of the existing CIA entrance. The grade of Route 123 would be lower than at present. The movement from Route 193 to Route 123 eastbound is accommodated with a ramp overpassing Route 123 that generally follows the alignment of the existing Route 123 eastbound lanes. The outbound CIA ramp merges with Route 193 eastbound and with the relocated Route 123 eastbound lanes just west of Merchant Lane.

An auxilliary lane is indicated along Route 123 westbound to serve as an acceleration/deceleration, free-flow right turn lane at and beyond the CIA entrance. This fourth lane would end as a right turn lane to Route 193. A connecting roadway is provided between Route 193 and Route 123 opposite Potomac School Road, which would have low traffic volume and would probably not warrant a traffic signal under current criteria.

The ramps into and out of the CIA entrance from Route 123 would be lengthened signficantly to provide the grade separation. The alignment of the outbound right turn ramp will require utilization of part of the Scattergood-Thorne Property.

A modification has been made to Alternative 4 in this study step to eliminate the weaving on eastbound Route 123 associated with making a right turn onto Merchant Lane. A ramp from eastbound Route 123 to eastbound Route 193 would be located east of Potomac School Road and utilized by traffic on eastbound Route 123 destined for Merchant Lane. This would avoid weaving across the eastbound Route 193 traffic merging with Route 123 west of Merchant Lane.

A variation of Alternative 4 was evaluated wherein Route 123 would pass over the ramps accessing the CIA and reduce encroachment on the Scattergood-Thorne Property. However, the resulting vertical alignment would be substandard and the elevation of the bridge much higher than with the preferred arrangement.



ALTERNATIVE 4
Route 123 • Route 193 • CIA Entrance

Figure 15

IV. EVALUATION OF CANDIDATE ALTERNATIVES

GENERAL

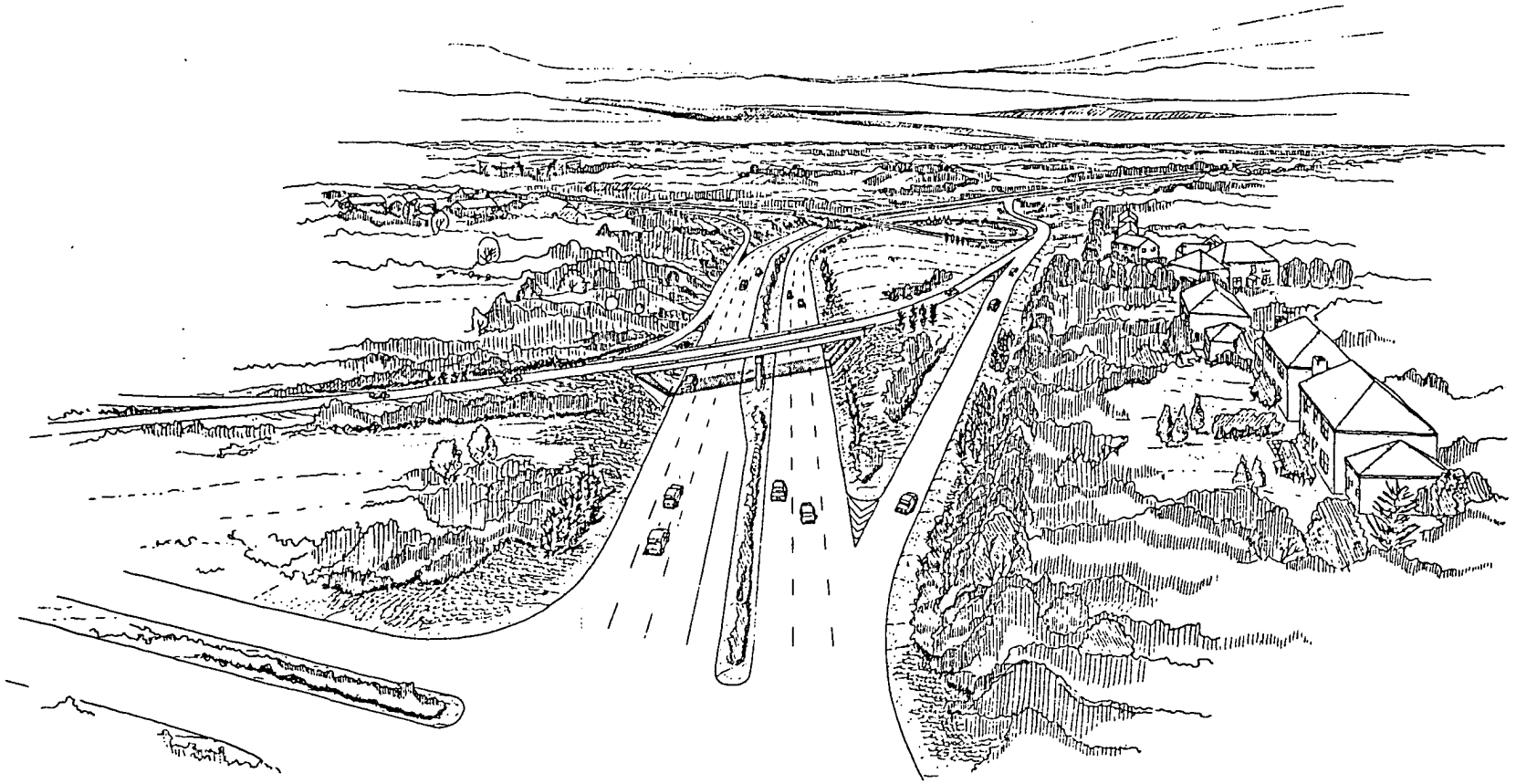
The two Alternatives selected for detailed evaluation differ significantly in concept. Alternative 2 is an at-grade solution wherein traffic flows would be controlled by interconnected signalization and intersection channelization. With Alternative 4, the major conflicting traffic movements are grade separated. The design features shown and described are required to provide acceptable service levels for the year 2005 forecast traffic volumes.

DESCRIPTION OF ALTERNATIVES

Alternative 2

In Alternative 2, the eastbound lanes of Route 123 would be relocated northerly adjacent to existing westbound Route 123 as indicated on Figure 14. Route 193 would be realigned to intersect with Route 123 opposite Potomac School Road. Three lanes in each direction would be provided on Route 123 separated by a variable-width median. The present median width would be retained at each end of the project. A fourth westbound lane, which is provided along Route 123 through the intersection with the CIA entrance, would drop as a free-flow right turn lane to Route 193.

Dual turning lanes are provided for left turns into and right turns out of the CIA entrance. The entrance would be widened to a four-lane divided cross section. A single turn lane is provided for left turns out of the CIA. Dual left turn lanes are needed for the Route 193 turn onto eastbound Route 123. The left turn lane for turns into the FHWA/CIA (Turkey Run Farm) Access Road would be retained. This access roadway would widen at the intersection of Route 193 to provide two outbound lanes—an exclusive lane for both left and right turning movements. Traffic signals would be installed at Route 123/CIA entrance and at the intersection of Route 193/Potomac School Road and Route 123.

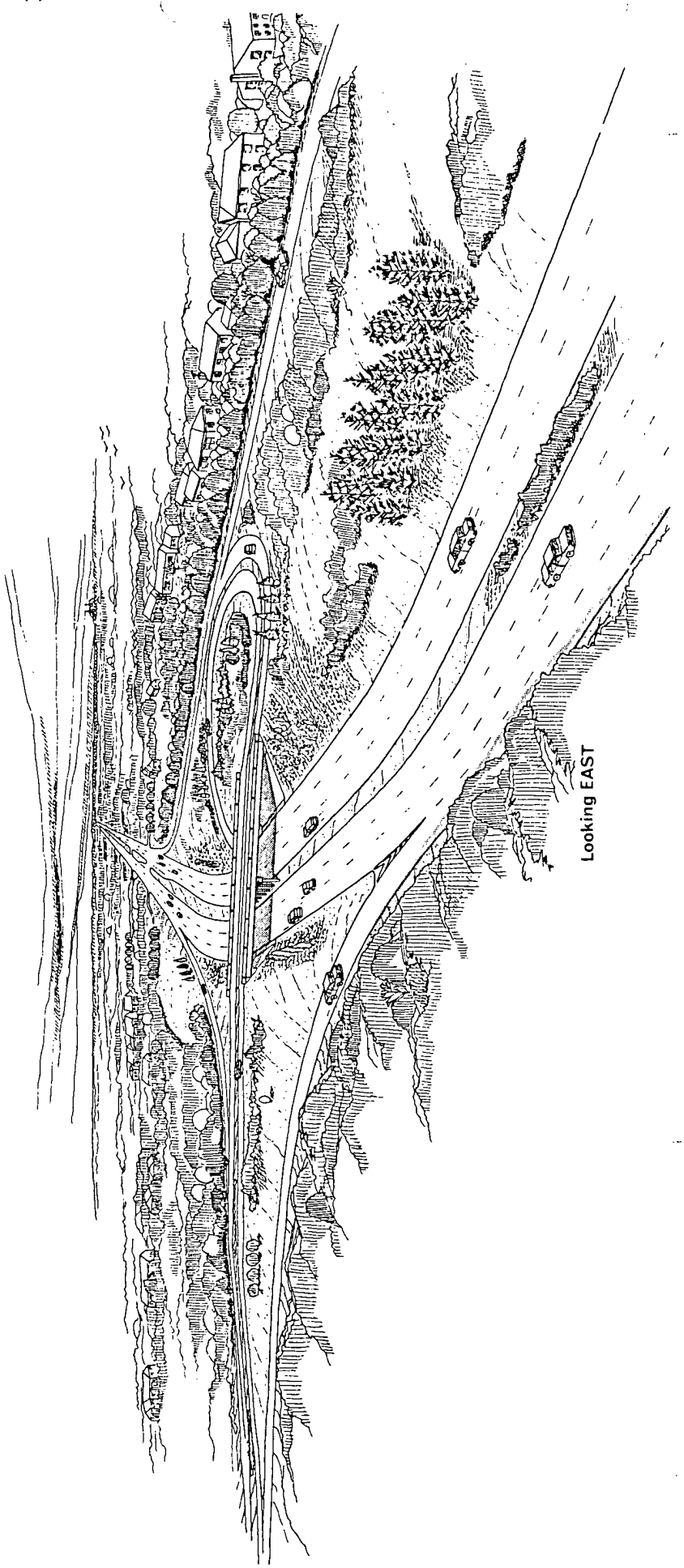


Looking EAST

Figure 15A

ALTERNATIVE 4
Conceptual View
Route 123 at Route 193

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1



ALTERNATIVE 4
Conceptual View
Route 123 at CIA Entrance

Figure 15B

Alternative 2 Modified

A variation of Alternative 2 was examined to evaluate Ad Hoc Citizen Group suggestions. This plan would modify Alternative 2 to shift the Route 193/Route 123 intersection approximatley 400 feet east of Potomac School Road in order to retain Route 193 near its present location. Potomac School Road would continue to intersect Route 123 but no direct link to Route 193 would be possible. All other road features would remain the same as in Alternative 2. Relative merits of Alternative 2 Modified compared to Alternative 2 are:

Advantages

- Shifts concentration of traffic away from Potomac School Road intersection.

Disadvantages

- Reduces length of left turn storage lanes for turns into CIA from eastbound Route 123.
- Adds a median crossover and results in substandard distances between crossovers.
- Increases the probability of traffic queues interfering with signal operation because of reduced distances between intersections.
- Retains offset for traffic destined from Potomac School Road to Route 193.
- Results in probable elimination of warrant for signal at the Potomac School Road/Route 123 intersection, contrary to the expressed desires of many community groups.

The undesirable features of the modification of Alternative 2 are sufficient reason to eliminate it from further consideration.

Figures 16 and 17 show the forecast traffic volumes for the year 2005 A.M. and P.M. peak hour, for Alternatives 2 and 4, respectively. The traffic projections are for unrestrained conditions in the A.M. peak hour and capacity restrained conditions for the P.M peak hour as described in Technical Memorandum No. 1. The peak hour levels of service are also indicated.

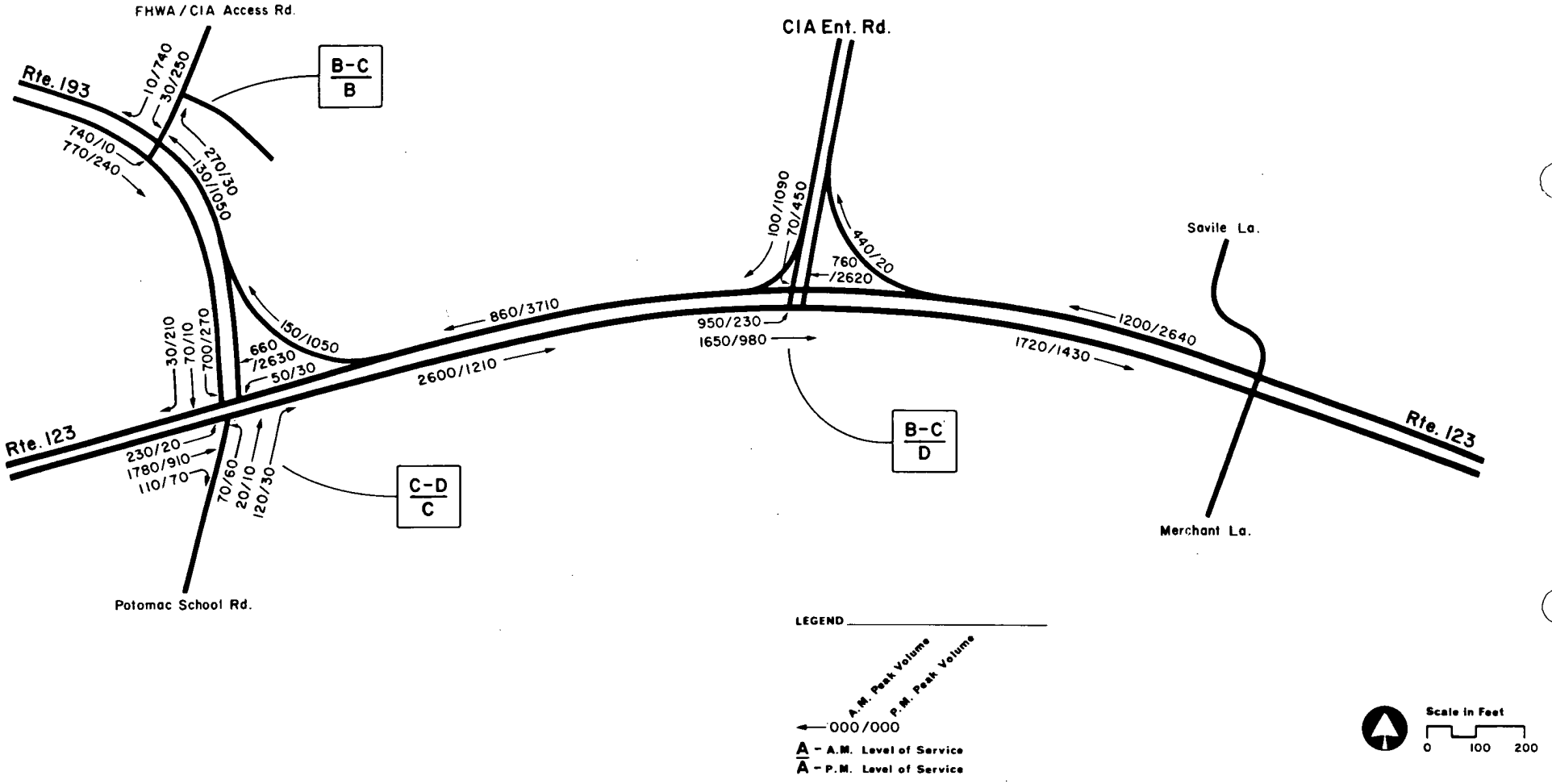


Figure 16

ALTERNATIVE 2
Year 2005 Peak Hour Traffic Volumes and Levels of Service

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

PRELIMINARY DESIGN STUDIES

Plan and profile studies were prepared on topographic mapping at a scale of 1" = 100' to establish horizontal and vertical alignments, define construction limits and verify right-of-way needs. Estimates of total project costs were also derived from these studies. These Preliminary Engineering Studies were developed emphasizing:

- Limiting encroachment outside existing road right-of-way.
- Minimizing visual impacts of the alternatives to the adjacent communities.
- Addressing the concerns stated by Citizen Groups where possible and applicable.

Design Criteria

The preliminary design studies are based on criteria contained in the current Policy on Geometric Design of Urban Highways and Arterial Streets, published by The American Assocation of State Highway Officials and on the standards and criteria of the Virginia Department of Highways and Transportation. Typical roadway sections for principal elements of each alternative are shown on Figure 18. Design criteria established for this study are summarized in Table IV-1.

Figures 14 and 15 show the horizontal and vertical alignments of Alternatives 2 and 4. The loop ramp providing inbound movement to the CIA in Alternative 4 has a 125-foot inside radius which is less than that typically used for loop ramps. However, this radius is capable of accommodating traffic at a speed of 20 miles per hour. The sharp radius was employed to minimize both additional right-of-way requirements and the northward relocation of the Route 123 roadway at the CIA entrance. All other geometric design features of both alternatives conform to the established design standards.

Estimates of Cost

Estimates of total project costs were made for both candidate alternatives. These include costs of construction, right-of-way acquisition, engineering, and a contingency allowance to cover unforeseen items or conditions. Construction costs

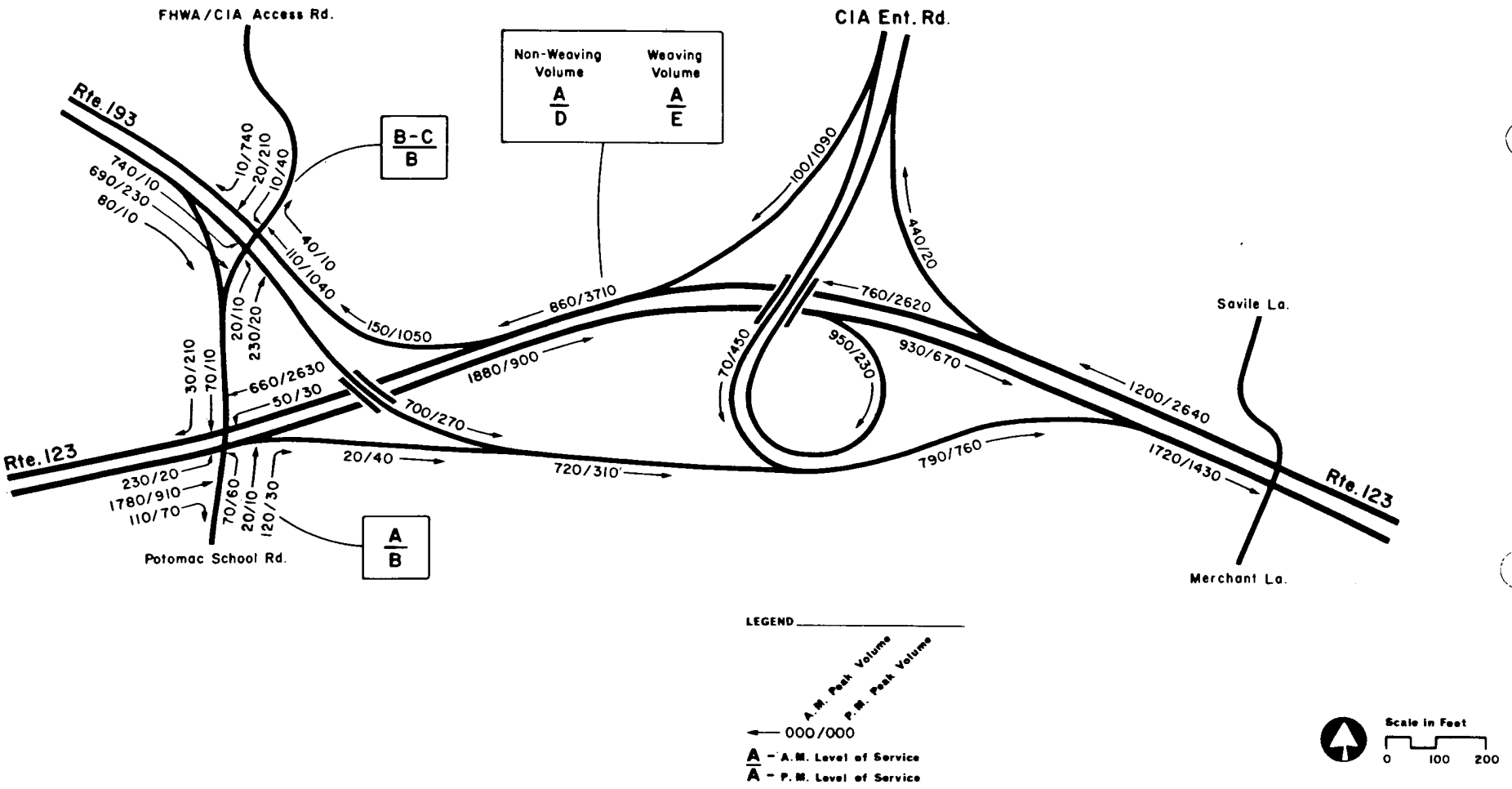


Figure 17

ALTERNATIVE 4
Year 2005 Peak Hour Traffic Volumes and Levels of Service

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

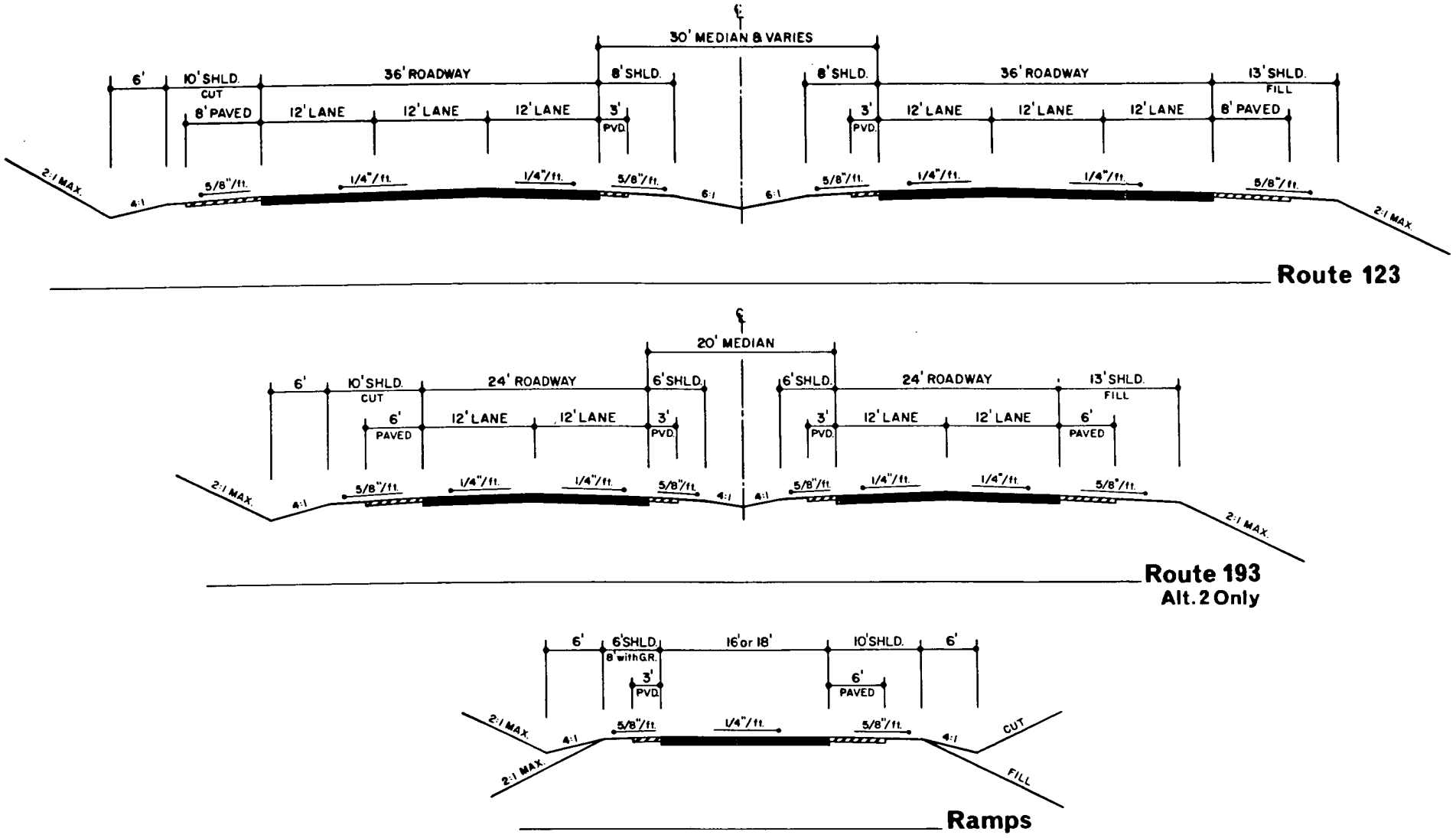


Figure 18

TYPICAL SECTIONS

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

Table IV-1. Geometric Design Criteria[1/]

	Routes 123 and 193	Directional Ramps	Loop Ramps
Design Speed	50 Mph	35 Mph	25 Mph
Stopping Sight Distance			
Desirable	475'	240'	160'
Minimum	375'	160'	120'
Horizontal Curvature			
Maximum Degree of Curvature	6	-	-
Minimum Radius	-	310'	150'
Maximum Percent Grade	6%	8%	8%
Vertical Curve Lengths	Sufficient to provide stopping sight distance based on 3'6" height of eye and 6" height of object.		
Roadway Vertical Clearance	16'6"	16'6"	16'6"
Maximum Rate of Superelevation	0.08 feet per foot, maximum		

1/ A Policy on Design of Urban Highways and Arterial Streets - published by American Association of State Highway and Transportation Officials.

Table IV-2. Estimated Project Cost[1/]

Item	Alternative 2	Alternative 4
Construction	$1,700,000	$4,800,000
Right-of-Way	-	2/
Design and construction engineering and administration	300,000	600,000
Sub-Total	2,000,000	5,400,000
Contingency (15%)	300,000	700,000
Total	$2,300,000	$6,100,000

1/ Current Dollars

2/ Assumes use of Scattergood-Thorne Property without cost

were derived from an estimate of material requirements developed from the 100-scale plan and profile studies. Table IV-2 lists the project costs for each alternative.

Staged Construction

Both alternatives require that Route 123 be widened to six lanes (three in each direction) in order to provide satisfactory levels of service in the horizon year 2005. This is consistent with VDHT long range planning but contrary to the preferences of adjacent communities.

Both alternatives have been evaluated to determine when the third lane would be required in each direction in order to maintain acceptable levels of service. This evaluation was performed for two cases, with and without the CIA expansion. The results are as follows:

Table IV-3. Years in Which Third Lane is Needed on Route 123

Alternative	Third Lane Needed on Route 123	
	With CIA Expansion	Without CIA Expansion
2	1986	1989
4	1994	1999

CHAPTER V

V. COMPARISON OF ALTERNATIVES

GENERAL

Alternatives 2 and 4 are both technically feasible from an engineering standpoint and provide generally adequate traffic service. Alternative 2 is significantly less costly while Alternative 4 would provide superior service levels for through traffic movements. Characteristics which should be considered in selecting one for implementation include:

ALTERNATIVE 2

The northerly shift of eastbound Route 123 and retention of at-grade, signalized intersections is in keeping with citizen preference. For Alternative 2 to provide adequate levels of service, Route 123 must be widened to six lanes. Failure to grade separate Routes 123 and 193 does not conform with past and future planning of VDHT.

Levels of service at the signalized intersections under certain conditions are at the lower end of the acceptable range. Growth in background (non-CIA) traffic beyond that projected will result in unacceptable levels of service at these locations.

The relocation of Route 193 opposite Potomac School Road will impact Potomac School Road from the standpoint of conflicting traffic movements; however it will provide a traffic signal that would benefit traffic turning into and out of Potomac School Road. No additional right-of-way would be required.

ALTERNATIVE 4

The grade separations of Route 123 and Route 193 conform with VDHT's planning for this location. The widening of Route 123 to six lanes conflicts with citizen preferences while the grade separation is opposed by some community groups. With the exception of the weaving condition between the CIA exit onto westbound Route 123 and Route 193, all intersections and traffic movements will operate at excellent levels of service. Significantly, the level of service for traffic weaving through this section would be service level E, which is considered substandard. The highest

elevation on the Route 193 ramp that overpasses Route 123 would be about three feet higher then the maximum roadway elevation on existing eastbound Route 123. The CIA ramp structure at the CIA entrance would be about four feet lower than the reference point. This alternative will require use of approximately 1.5 acres from the Scattergood-Thorne Property in the northwest quadrant of the CIA intersection with Route 123. Table V-1 contains the summary results of the comparison of Alternatives 2 and 4.

Table V-1. Comparative Summary of Candidate Alternatives

Criterion	Alternative 2		Alternative 4	
Traffic Levels of Service Along Route 123 in year 2005:	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
CIA In/Out	C	D	A	A
W.B. Weaving (CIA to 193)	NA	NA	A	D-E2/
Route 193	D1/	C	A	A
Potomac School Road	D	C	A	B
Right-of-way Requirements	None		1.5 acres of Scattergood-Thorne Property	
Cost	$2,300,000		$6,100,000	

NA - not applicable

1/ Combined with Potomac School Road intersection

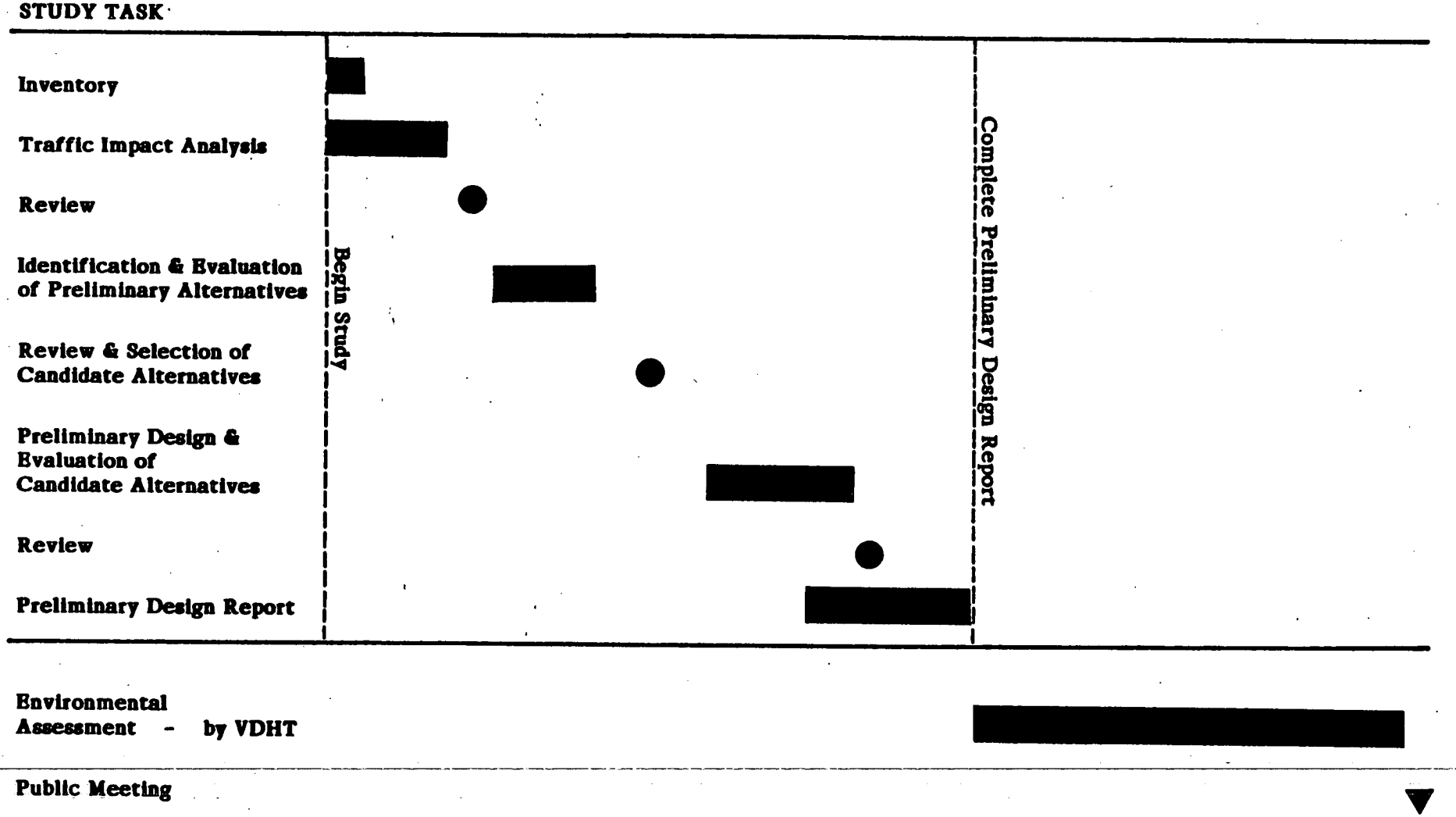
2/ Levels of service for both weaving and non-weaving traffic - first letter is for non-weaving traffic, second letter is for weaving traffic.

APPENDIX

Approved For Release 2009/03/20 : CIA-RDP89-00244R000701520001-1

PRELIMINARY DESIGN REPORT

DEVELOPMENT



LEGEND: ● Advisory Committee Meeting

▼ Public Meeting